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DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT, AND CERTAIN INDEPENDENT AGENCIES APPROPRIATIONS FOR FISCAL YEAR 1984

HEARINGS

BEFORE A

SUBCOMMITTEE OF THE

COMMITTEE ON APPROPRIATIONS
UNITED STATES SENATE

NINETY-EIGHTH CONGRESS

FIRST SESSION

ON

H.R. 3133

AN ACT MAKING APPROPRIATIONS FOR THE DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT, AND FOR SUNDRY INDEPENDENT AGENCIES, BOARDS, COMMISSIONS, CORPORATIONS, AND OFFICES FOR THE FISCAL YEAR ENDING SEPTEMBER 30, 1984, AND FOR OTHER PURPOSES

PART 2 (Pages 983-1761)

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
FEDERAL EMERGENCY MANAGEMENT AGENCY
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
NATIONAL SCIENCE FOUNDATION
NEIGHBORHOOD REINVESTMENT CORPORATION

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DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT-INDEPENDENT AGENCIES APPROPRIATIONS FOR FISCAL YEAR 1984

THURSDAY, APRIL 14, 1983

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, D.C.

The subcommittee met at 10:15 a.m. in room SD–124, Hon Jake Garn (chairman) presiding.

Present: Senator Garn.

NATIONAL SCIENCE FOUNDATION

STATEMENT OF DR. EDWARD A. KNAPP, DIRECTOR

ACCOMPANIED BY DR. LEWIS M. BRANSCOMB, CHAIRMAN, NATIONAL SCIENCE BOARD

OPENING REMARKS

Senator GARN. The subcommittee will come to order.

The National Science Foundation is the principal Federal agency for the support of basic research across all fields of science. NSF accounts for about 27 percent of all Federal support for basic research going to academic institutions. In some fields, NSF provides the dominant share of Federal basic research support: More than 66 percent in ground-based astronomy, 60 percent in environmental sciences, and over 50 percent in mathematics and engineering. About 2,000 colleges, universities, industrial firms, and other organizations participate in NSF programs through over 13,000 grant awards.

The quality of research proposals is determined through a system of peer review. More than 30,000 scientists, engineers, and science educators in all parts of the United States participate in NSF grant award processes each year.

BUDGET REQUEST

For fiscal year 1984, you are requesting $1,292,300,000. This represents an increase of $200,100,000, which is the net effect of an increase of $190,700,000 in research and related activities; no increase in science education activities; and an increase of $400,000 in your special foreign currency program.

Dr. Knapp, I am certainly pleased to have you here for your first appearance before this committee. You are in the somewhat unique position of being welcomed to your new position with an 18-percent increase in your budget—an indication of the priorities placed on science and technology by the President. I am happy to have both of you here.

Dr. Knapp, if you would like to, proceed with your opening statement.

PREPARED STATEMENT

Dr. **Knapp**. Thank you, Mr. Chairman. I am very pleased to be here. I would like to submit my written testimony for the record and summarize it orally.

Senator **Garn**. I would be happy to have it placed in the record.

[The statement follows:]

STATEMENT OF DR. EDWARD A. KNAPP, DIRECTOR, NATIONAL SCIENCE FOUNDATION

Mr. Chairman and members of the subcommittee, I appreciate the opportunity to appear before this committee to discuss the Foundation's budget request for fiscal year 1984. The request totals $1,292.3 million, an increase of $195.1 million, or 17.8 percent above the current plan for fiscal year 1983. The funds included in this request will support a strong and well-balanced basic research effort in science and engineering. Special emphasis will be given to those areas with the greatest potential for improving the Nation's future economic health and enhancing its technological capabilities. The funds will help restore and maintain the quality of science and mathematics education in the Nation's schools and strengthen scientific and engineering research training for graduate students in our colleges and universities. I am confident that the programs we propose will move us closer to the President's goal of maintaining the technological leadership of the United States today and into the future.

Fundamental research is the essential cornerstone of U.S. science. The Foundation proposes to increase support for basic research in fiscal year 1984 by 18.3 percent above the amount estimated for fiscal year 1983. This growth rate, reflects two things: (1) The importance that the President attributes to basic research as laying the groundwork for economic recovery and long-term economic growth; and (2) the need to strengthen and revitalize the research base in the Nation's universities and colleges and to improve their ability to produce the highest quality scientists and engineers needed in the years ahead.

IMPACTS AND BENEFITS OF NSF'S RESEARCH INVESTMENT

The Foundation plays a wide-ranging role in support of research in the mathematical, physical, geophysical, biological, social, and behavioral sciences, and engineering. Its support complements the research programs of Federal mission agencies.

In fields like chemical engineering, mathematics, environmental biology, anthropology, and civil engineering, NSF supports approximately 90 percent or more of university-based, fundamental research. In others such as chemistry, electrical engineering, earth sciences, and materials research, the Foundation provides at least 50 percent or more of the Federal funds for academic basic research. Similarly, the five NSF-funded national astronomy centers make advanced, unique facilities available to over 1,300 astronomers every year; NSF is the primary source of new instruments for ground-based astronomy.

It is estimated that in fiscal year 1984 about 16,000 scientists and engineers and some 10,300 graduate students will be supported under awards from NSF's programs. Most are located in nearly 400 colleges and universities in all 50 States and the District of Columbia.

In addition, the Foundation supports and manages the entire U.S. national program in the Antarctic.

NSF programs strengthen U.S. science by broadening its base. For example, through our international programs we support and manage bilateral agreements with some 30 countries, executing lead agency responsibility in the majority of them.

NSF's small business innovation research program, initiated in fiscal year 1977, has made over 400 awards to small businesses in 38 States, and has served as a model for similar programs elsewhere in the Federal Government.

Finally, under our university/industry cooperative research centers program we have, since 1973, provided the seed money for the establishment of 10 centers. One, at the Massachusetts Institute of Technology, has subsequently become self-supporting with industry financing while another in computer-aided design at Rensselaer Polytechnic Institute now receives over 70 percent of its support from industry.

Mr. Chairman, as you and the other committee members are aware, the primary justification for Federal support of fundamental research is its long-term contribution to the Nation's science and technology base, including scientific and engineering manpower. Because such investments are often large or very risky, and because their benefits are not easily capturable in the market, the private sector will tend to underinvest in such work. While no one can foresee the exact nature of the problems and needs which this country will face tomorrow, we can be certain that basic scientific and engineering knowledge will lay a significant portion of the groundwork for addressing them.

With this broader perspective in mind, let me give a few examples of some of the practical benefits which might flow from recent work funded by NSF. These examples highlight the potential impact of the Foundation's programs on our daily lives and the continuing importance of the national investment in fundamental research.

CONVERSION OF METHANE FOR INDUSTRIAL USE

A means for converting methane, a major component of natural gas, into a practical raw material for chemical synthesis has been a long-term industrial goal. As a by-product in petroleum refining, natural gas has frequently been considered a waste product, cheaper to burn than to transport. If methane could be partially oxidized economically in a simple, on-site reactor, the economics would change dramatically and the resulting raw material could be used either in the manufacture of gasoline or a variety of plastics, fibers, and other polymers based on petrochemicals.

A major step in the direction of achieving this goal has resulted from work by Jack H. Lundsford of Texas A&M in fundamental studies on reactions involving oxygen ions on metal oxide surfaces with hydrocarbons such as methane. Lundsford found that methane could be oxidized to methanol and formaldehyde—much more useful materials for chemical synthesis—by nitrous oxide if the reaction were carried out in the presence of a molybdenum catalyst. While the use of nitrous oxide on a large scale would be too expensive, the understanding of the reaction process provided by the research has considerable technological significance. Lundsford notes that there has been considerable industrial interest in the research and is optimistic that a catalyst effective with O_2 rather than N_2O can be found. Finding such a catalyst would enable industry to convert a waste material into an economic source of petrochemicals.

WAR AGAINST TERMITES—NEW PESTICIDE DEVELOPED

Termites annually cost U.S. property owners an estimated $750 million. A chemist at the State University of New York at Stony Brook, Glenn D. Prestwich, has developed a new pesticide which uses methods that the insects themselves employ to kill their enemies. The lethal chemical is introduced into tiny blocks of sweet gum, ash, or aspen wood. As an added lure, Prestwich had the blocks of wood prerotted by a fungus, to yield an irresistible termite delicacy. Once the termites have dined on the lethal chemical, they return to their colonies to live about 3 more days—the time it takes to digest and activate poisoned food. During this time they transfer the poison to their fellow nest mates, killing as many as 60,000 of them at a time.

This new insecticide has many advantages over previously used termite poisons. For example, it can be delivered to affect only termites; it remains effective long enough to wipe out entire colonies; and it leaves no harmful residue.

LOCATION IN THE BRAIN OF MEMORY FOR MOTOR BEHAVIOR

The search for the location in the brain where learned information is stored has been long and elusive. Richard Thompson and his colleagues at Stanford University believe they have localized a brain region involved in the storage of a specific memory. The investigators taught an animal to change the movement of its eye and eye-covering membrane in response to an audible sound. When a small portion of the brain was removed from these animals, the learned behavior disappeared even though the normal movement of the eye and eye-covering membrane was not impaired. Subsequent studies have shown a similar effect with a conditioned leg-flexing response to a tone. These are the first demonstrations that a specific kind of learned information may be stored at a discrete site in the brain. These discoveries provide the basis for further investigations to localize other sites of memory storage and to understand the basis of learning disabilities.

OPTICAL SWITCHES

Our present telephone communication system is being substantially upgraded with the installation of the new technology of fiber optic cables for carrying voice and data transmissions. The principal advantage of laser light transmission is the enormous bandwidth which permits carrying many simultaneous messages on the same light beam. However, light-carried information must be switched from the caller to the receiver. For example, a call from Washington, D.C., to New York City requires appropriate switch connections to be determined and set up to connect the conversing parties.

Fiber optics communications are presently limited because the switching must still occur electronically although transmission is optical. This requires reducing the wide optical band width down to the narrow electronic band and then up again to an optical band width. As a consequence, present electronic switching provides bottlenecks limiting the attainment of the full efficiency of fiber optics. An all-optical switching circuit would eliminate this bottleneck. However, optical switching is not yet possible because the optical analog of an electronic transistor has not yet been developed.

Researchers at the University of Arizona and Bell Laboratories, supported under NSF's university/industry cooperative research program, are working together to establish the technical feasibility of such switches by fundamental research into their basic physics. The possibility that optical switches could exist was established at Bell Laboratories several years ago. However, the first devices operated very slowly and only at very low temperatures. Recent research by Hyatt Gibbs at the University of Arizona and Arthur Gossard and his colleagues at Bell labs has produced devices which will operate at room temperature and at much higher speeds. This research is a major step in the direction of a new optical technology which will revolutionize electronics as the transistor once did.

MICROBURSTS AND AIRCRAFT HAZARD

T. Fujita, of the University of Chicago, has joined John McCarthy, of the National Center for Atmospheric Research, to investigate very intense, short-lived downdrafts. When these downdrafts occur close to the ground and lead to a horizontal spread of the air column, the phenomenon is called a microburst.

An aircraft crossing a microburst encounters first a strong headwind and then a strong tailwind after it passes the burst's center, resulting in an extremely hazardous situation. Microbursts have been implicated as major factors in a number of aircraft accidents and near accidents during takeoffs and landings. A field experiment phase of this study conducted in the Denver-Stapleton Airport area from May 15 to August 15, 1982, was successful in accumulating a large amount of data from over 50 wind-shear occurrences. It is anticipated that analysis and interpretation of these data sets will lead to improved understanding and detection of microbursts and resulting improvements in aircraft safety.

UTILIZING THE RADIO FREQUENCY SPECTRUM

An important national resource—the radio frequency spectrum from 30 to 1,000 MHz—is underutilized due to limited efficiency and selectivity of current communication receivers. The growing demand for more communications channels in this frequency range is not being satisfied and a low-cost, transmission efficient, highly selective band pass filter technology would substantially improve spectrum utilization. Current filter technology utilizes surface acoustical wave devices which have sharp frequency bands but with accompanying high transmission losses. In addition, the design and production of surface acoustic wave devices is presently based primarily on trial and error.

Research by Clinton Hartmann and Peter Wright of R.F. Monolithics of Dallas, Tex., supported under the small business innovation program, has developed a theoretical model of the interactions between the acoustical and electromagnetic waves and their reflection at the input and output terminals of these devices. Using the equations from this model, it is now possible to design the surface acoustical wave devices to increase greatly their energy efficiency while maintaining their sharp band characteristics.

The investigators have actually designed and produced experimental devices using their theoretical model. Not only are the devices greatly improved, in terms of transmission efficiency, but it appears that they can be produced at a substantially lower cost than is possible using existing production techniques based on trial and error rather than scientific understanding. If this is the case, their widespread commercial production and adoption might substantially expand our ability to use the radio frequency spectrum more efficiently.

FISCAL YEAR 1984 BUDGET HIGHLIGHTS

In formulating specific program and budget priorities for fiscal year 1984, several criteria were used: The scientific excellence and promise of the activity; the need to sustain scientific momentum in certain key areas; maintenance of a broad base of support across a wide variety of science and engineering disciplines; and the potential for an activity to contribute to important national economic and productivity goals.

The highlights of our fiscal year 1984 request include:

—An overall emphasis on the physical sciences and engineering, with special attention to mathematics, materials research, astronomy, Earth sciences, and mechanical, electrical, and computer engineering.

—A priority within the biological sciences for research in the scientifically exciting and economically important area of plant biology.

—A substantial increase in support for the social and economic sciences.

—A high priority on instrumentation, with support estimated to increase by 61 percent over fiscal year 1983, because sophisticated instrumentation and data processing equipment are of central importance to the conduct of cutting-edge research in virtually every field of science and engineering today.

—A new program of Presidential Young Investigators Awards to support the research efforts of outstanding young university faculty members in selected fields of science and engineering.

—A new program aimed at the Nation's undergraduate colleges and designed to encourage and strengthen independent faculty research and the involvement of undergraduates as research assistants.

—Two major capital investment projects in the U.S. Antarctic program—replacement of a large maintenance facility destroyed by fire in 1981 and the beginning of a service life extension program for the two oldest LC-130 ski-equipped Hercules aircraft.

—Increased support for research involving cooperation between university and industrial scientists and engineers.

Let me now turn to our budget request within the various research activities.

MATHEMATICAL AND PHYSICAL SCIENCES (MPS)

The amount requested for the mathematical and physical sciences activity is $364.3 million, an increase of $64.6 million, or 21.5 percent, above the fiscal year 1983 current plan. Substantial increases in support are provided across the full spectrum of MPS subactivities. At the same time, special emphasis is placed on the mathematical sciences and on materials research.

Research excellence in mathematics depends on opportunities for interaction among researchers. Support for the two mathematical science research institutes enhances this interaction in fiscal year 1984. In addition, a substantial improvement is made in the support of mathematics graduate and postdoctoral students and for access to scientific computing facilities.

In other parts of the MPS activity, support for instrumentation and large facilities required for significant scientific advances is enhanced.

The proposed emphasis will strengthen central facilities and major instrumentation at the 14 materials research laboratories supported by NSF, improve the experimental capability of the Cornell electron storage ring, the Indiana University cyclotron, the electron accelerator at Illinois, the low-energy nuclear physics laboratories, and continued construction of the Michigan State University superconducting cyclotron.

Increased support emphasizing research instrumentation is provided to strengthen the Nation's academic research effort in chemistry.

The planned development of modern experimental computer research facilities at academic institutions will be continued. In fiscal year 1984, the Foundation will establish 4 to 5 additional facilities to bring the total to 18 or 19 by the end of the fiscal year.

ENGINEERING

The Foundation is continuing to place a high priority on support of fundamental research in engineering. Support for this activity will total $123 million, an increase of $22.2 million, or 22 percent, above the fiscal year 1983 current plan.

Research in engineering underlies technologies and processes critical to our Nation's manufacturing, computer, electronics, and chemical industries. In fiscal year 1984, we plan to increase emphasis on research in robotics, microelectronics, biotechnology, and automated manufacturing.

In recent years, there have been shortages of engineering faculty and advanced graduate students in key areas. We must have more of both if the Nation is to produce the trained engineers and technicians needed to staff our industrial and governmental institutions.

In our fiscal year 1984 request, we respond to this problem by proposing major increases in the support of young engineering faculty, both through the ongoing research initiation grants program and the initiative the President has proposed for young faculty.

In addition, the Foundation places priority on improving the availability of research instrumentation in engineering departments through larger grants and through a special matching fund equipment competition.

BIOLOGICAL, BEHAVIORAL, AND SOCIAL SCIENCES

Support for the biological, behavioral, and social sciences totals $223.6 million, an increase of $33.4 million, or 17.5 percdnt, above the current plan for fiscal year 1983.

The National Science Board and Foundation staff and advisory panels have examined the challenges and scientific opportunities presented by research in plant biology. Developments in such areas as molecular biology, genetics, and membrane research, as well as striking advances in instrumentation and techniques available for biological research could revolutionize our understanding of basic mechanisms in plants and their interaction with their environments.

Increases in support of research in physiology, cellular and molecular biology, and in biotic systems and resources are requested in order to emphasize plant biology and encourage more young faculty and postdoctoral candidates to consider this important and scientifically exciting area of work.

In the social and economic sciences, within the 17.7-percent increase over fiscal year 1983, attention will be given to strengthening major social science data bases, such as the general social survey and the panel study of income dynamics, and to methodological research to improve the scientific usefulness of these resources.

ASTRONOMICAL, ATMOSPHERIC, EARTH, AND OCEAN SCIENCES

The fiscal year 1984 budget request for the astronomical, atmospheric, Earth, and ocean sciences activity is $334.9 million, an increase of $58.8 million, or 21.3 percent, above the fiscal year 1983 current plan.

A major emphasis is given to the astronomical sciences which receives a 25.9-percent increase. The increase will allow upgrading instrumentation at university and national observatories and will support design studies for the very long baseline array. We are not proposing construction of this major, new radio telescope in this budget but are laying the necessary groundwork for its future consideration.

Previous emphasis on Earth sciences is continued in fiscal year 1984 to allow year-round continental reflection profiling operations and general upgrading of much of the research instrumentation which has become obsolete.

In fiscal year 1984, the Foundation expects to invest about $68 million to support crustal research on the ocean and continents. Included is $26.3 million for the ocean drilling program now incorporated into the AAEO activity. A distinguished committee of Earth and ocean scientists has reviewed priorities and directions for crustal research.

Their recommendation is to continue ocean drilling, preferably with a leased commercial drill ship. This recommendation is under review by the Foundation. As plans are developed, we will present appropriate program recommendations to the Congress.

It is now clear that in fiscal year 1983, a reprograming of an additional $2 million to the deep sea-drilling project will be necessary. I shall be presenting soon such a request for the undistributed activity shown in our budget estimate.

U.S. ANTARCTIC PROGRAM

Last February, the President issued a decision memorandum stating that the Foundation was to continue to budget for and manage the entire U.S. national program in the Antarctic. It also stated that the program was "not to be funded at the expense of other National Science Foundation programs. . ." Thus, in developing its fiscal year 1984 request of $102.1 million, NSF received special budgetary guidance from the OMB reflecting the responsibility this program carries. This increase will provide for two major capital investment projects totaling $10.8 million, plus an increase of $1 million for research projects conducted on the Antarctic Continent.

SCIENTIFIC, TECHNOLOGICAL, AND INTERNATIONAL AFFAIRS (STIA)

The scientific, technological, and international affairs activity includes a variety of responsibilities that cut across the Foundation's scientific and engineering disciplines. Prominent among these are the new Presidential Young Investigator Awards; international programs; small business innovation research; the industry/university cooperative research programs; and our programs for expanding opportunities for women and minorities in science and engineering research careers.

The fiscal year 1984 budget request reflects the result of an extensive rethinking of the present distribution of management responsibility at the Foundation, particularly with regard to these cross-cutting activities. I have concluded that program officers in the research directorates have construed their responsibilities much too narrowly, with too little attention to the broad educational aspects of research, the full utilization of women and minorities in science, international science, and other concerns not seen as pivotal to their specific disciplines. I have, therefore, proposed that responsibility for receiving, evaluating, and decisionmaking on all research proposals be assumed by program officers in the research directorates and that STIA program officers assume responsibility for Foundation-wide coordination of many of the cross-cutting activities, especially international science.

A shared distribution of management responsibility would be initiated, building on the special strengths of both the STIA and research directorate program staffs. Through this approach, I believe that the special programs, which have previously been separately managed and planned for, may be strengthened and expanded as they become a more central part of the entire Foundation's operations.

The fiscal year 1984 budget request for the STIA activity is $36.8 million, a decrease of $7.4 million from the fiscal year 1983 current plan. However, an estimated $23.2 million within the requests for the Foundation's disciplinary research activities will bring the effective total of the various NSF programs listed in this activity to $60 million.

Within the STIA activity, the $36.8 million will include:

—Support of visiting scientists, workshops, seminars, and conferences necessary to establish and maintain U.S. participation in bilateral international scientific activities;

—Funds for 3 to 4 new industry/university cooperative research centers and 6 to 10 new planning grants for additional centers; and

—An increase in support of cooperative research between university and industrial scientists.

The estimated $23.2 million to be provided from within the amounts requested for the Foundation's discipline-oriented research programs will include:

—Approximately $6 million for first-year support of up to 200 Presidential Young Investigators Research Awards;

—$5.9 million for support of research conducted under bilateral agreements and an additional $2 million to initiate a new United States/India joint program;

—$3 million to encourage independent faculty research in the Nation's predominantly undergraduate colleges and to improve generally the research environment in these institutions that provide baccalaureate degrees for so many of our scientists and engineers;

—$2.5 million for completing existing commitments in the experimental program to stimulate competitive research; and

—$1.1 million to insure that our obligations under the Small Business Innovation and Development Act are fully met.

PROGRAM DEVELOPMENT AND MANAGEMENT (PD&M)

The fiscal year 1984 budget request for the PD&M activity which provides resources for the management of NSF, totals $66 million, an increase of only $0.7 million, or 1.1 percent, over fiscal year 1983. It continues to be a source of satisfaction with us that less than 6 percent of the Foundation's budget is required to meet its management costs.

Consistent with the management changes I have proposed for fiscal year 1984, we will operate at a level of 1,194 FTE's, a decrease of 24 from fiscal year 1983. Personnel compensation and benefits in fiscal year 1984 will be funded at $48.2 million, a decrease of $0.6 million from fiscal year 1983. Travel for staff, proposal reviewers, panelists and advisers, and the request for data processing equipment remain level with the fiscal year 1983 current plan. I am pleased to say that the Foundation is making excellent progress in implementing its long-range plan for improving its data processing and management information capabilities. Finally, central support services such as rent, telephone, telegraph, postage, and audit services—most of which are uncontrollable by the Foundation—will increase by $1.3 million, or 9.6 percent. This will place them just slightly above their fiscal year 1982 actual level and will allow us to meet our requirements satisfactorily.

SCIENCE AND ENGINEERING EDUCATION

For the science and engineering education activity, the budget request totals $39 million, an increase of 30 percent, or $9 million, above the fiscal year 1983 current plan. Of this increase, $4 million will be used to raise the stipend and cost-of-education allowance for about 1,390 graduate fellows. The stipend will go from $6,900 to $8,100; the cost-of-education allowance from $4,000 to $4,900.

During fiscal year 1983, the Foundation expects to introduce two Presidential initiatives in science education to address the critical problem of mathematics and science teaching in the secondary schools. These will be:

—Presidential awards for teaching excellence in science and mathematics to recognize outstanding secondary school teachers of these subjects who can serve as models for their colleagues; and

—Presidential secondary school science and mathematics teaching improvement to provide support for the improvement of the quality of science and mathematics education in grades 6 through 12.

The balance of the requested increase of $5 million for fiscal year 1984 will be used to expand these programs. Both of these Presidential initiatives will be closely coordinated with the Department of Education which is proposing a $50 million program for each of 4 years to address shortages of secondary school teachers in science and mathematics.

CONCLUSION

Mr. Chairman, fundamental research is the basis of the science and engineering enterprise in our country. The Foundation has played a key role in the Federal Government's support of such research for over 30 years.

The fiscal year 1984 budget request recognizes and continues this important role by providing an increase of over 18 percent for support of basic research; inaugurating a new program of Presidential awards for outstanding young scientists and engineers; substantially increasing the amount of support available for research instrumentation and graduate students; inaugurating a new program to encourage faculty research at the Nation's small colleges; and maintaining our commitment to expand opportunities for women and minorities to participate in careers in engineering and science. I urge your support of this request.

SYNOPSIS OF STATEMENT

Dr. KNAPP. Mr. Chairman and members of the subcommittee, I appreciate the opportunity to appear before this committee to discuss the Foundation's budget request for fiscal year 1984. The request totals $1,292,300,000, an increase of $195.1 million, or 17.8 percent, above the current plan for fiscal year 1983. The funds included in this request will support a strong and well-balanced basic research effort in science and engineering. Special emphasis will be given to those areas with the greatest potential for improving the Nation's economic health and enhancing its technological capabilities. The funds will help restore and maintain the quality of science and mathematics education in the Nation's schools and strengthen scientific and engineering research training for graduate students in the colleges and universities. I am confident that the programs proposed will move NSF closer to the President's goal of maintaining the technological leadership of the United States today and into the future.

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In formulating specific program and budget priorities for fiscal year 1984, NSF used several criteria: The scientific excellence and promise of the activity; the need to sustain scientific momentum in certain key areas; the maintenance of a broad base of support across a wide variety of science and engineering disciplines; and the potential for an activity to contribute to important national economic and productivity goals.

BUDGET HIGHLIGHTS

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The planned development of modern experimental computer research facilities at academic institutions will be continued. In fiscal year 1984, the Foundation will establish four or five additional facilities to bring the total to 18 or 19 by the end of the fiscal year.

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PLAN FOR RADIO TELESCOPE

A major emphasis is given to the astronomical sciences which receive a 25.9-percent increase. The increase will allow the upgrading of instrumentation at university and national observatories and will support design studies for the Very Long Baseline Array. We are not proposing construction of this major, new radio telescope in this budget, but are laying the necessary groundwork for its future consideration.

In fiscal year 1984, the Foundation expects to invest about $68 million to support crustal research on the ocean and continents. Included is $26.3 million for the ocean drilling program now incorporated into the AAEO activity. A distinguished committee of Earth and ocean scientists has reviewed priorities and directions for crustal research. Their recommendation is to continue ocean drilling, preferably with a leased commercial drill ship. This recommendation is under review by the Foundation. As plans are developed, we will present appropriate program recommendations to the Congress.

The scientific, technological, and international affairs activity includes a variety of responsibilities that cut across the Foundation's scientific and engineering disciplines. Prominent among these are the new Presidential Young Investigators Awards, international programs, small business innovation research, the industry/university cooperative research programs, and programs for expanding opportunities of women and minorities in science and engineering research careers.

The fiscal year 1984 budget request reflects an extensive rethinking of the present distribution of management responsibility at the Foundation, particularly with regard to these crosscutting activities. I have concluded that program officers in the research directorates have construed their responsibilities much too narrowly, with too little attention to the broad educational aspects of research, the full utilization of women and minorities in science, international science and other concerns not seen as pivotal to their specific disciplines. I have, therefore, proposed that responsibility for receiving, evaluating, and decisionmaking on all research proposals be assumed by program officers in the research directorates and that STIA program officers assume responsibility for Foundation-wide coordination of many of the crosscutting activities, especially international science.

A shared distribution of management responsibility should be initiated, building on the special strengths of the STIA and research directorate program staffs. Through this approach, I believe that the special programs, which have previously been separately managed and planned for, may be strengthened and expanded as they become a more central part of the Foundation's operations.

The fiscal year 1984 budget request for the STIA activity is $36.8 million, a decrease of $7.4 million from the fiscal year 1983 current plan. However, an estimated $23.2 million within the requests for the Foundation's disciplinary research activities will bring this effective total for the various NSF programs listed in this activity to $60 million.

The fiscal year 1984 budget request for the program development and management activity which provides resources for the management of NSF totals $66 million, an increase of only $700,000, or 1.1 percent, over fiscal year 1983. It continues to be a source of satisfaction at NSF that less than 6 percent of the Foundation's budget is required to meet its management costs.

SCIENCE AND ENGINEERING EDUCATION

For the science and engineering education activity, the budget request totals $39 million, an increase of 30 percent, or $9 million, above the fiscal year 1983 current plan. Of the increase, $4 million will be used to raise the stipend and cost-of-education allowance for about 1,390 graudate fellows. The stipend will be raised from $6,900 to $8,100; the cost-of-education allowance from $4,000 to $4,900.

During fiscal year 1983, the Foundation expects to introduce two Presidential initiatives in science education to address the critical problem of mathematics and science teaching in the secondary schools. These will be Presidential awards for teaching excellence in science and mathematics to recognize outstanding secondary school teachers of these subjects who can serve as models for their colleagues, and Presidential secondary school science and mathematics teaching improvement to provide support for improvement of the quality of science and mathematics education in grades 6 through 12.

The balance of the requested increase of $5 million for fiscal year 1984 will be used to expand these programs. Both of these Presidential initiatives will be closely coordinated with the Department of Education which is proposing a $50 million program for each of 4 years to address shortages of secondary school teachers in science and mathematics.

Mr. Chairman, fundamental research is the basis of the science and engineering enterprise in our country. The Foundation has played a key role in the Federal Government's support of such research for over 30 years.

The fiscal year 1984 budget request recognizes and continues this important policy by providing an increase of more than 18 percent for support of basic research.

Thank you very much, Mr. Chairman.

SCIENCE BOARD CHAIRMAN

Senator GARN. Dr. Branscomb?

Dr. BRANSCOMB. Senator, I am pleased to be here. This is an important turning point in the Foundation's recent budgetary history, at a time when the Nation is turning toward its technological strengths as the basis for its future economy. Recognizing the financial stringency we all face, I think the NSF budget is a prudent and well-thought-out budget. A substantial part of the Board's activity during the past year was devoted to the selection of priorities within this budget.

I will be happy to answer questions you may have.

REPROGRAMING OF FUNDS

Senator **Garn**. Thank you very much.

As you know, the HUD-Independent Agencies Senate and House reports have, for the last several years, carried a requirement that:

> Agencies funded through this bill notify the chairman of the HUD-Independent Agencies Subcommittee prior to reprograming of funds in excess of $250,000 or 10 percent, whichever is less, between program or activities.

On December 23, 1982, the Foundation forwarded a reprograming request to the committee which involved a series of changes in major program areas. On January 4, I wrote a letter to NSF approving that reprograming request. However, I now understand that a number of actions, well in excess of the $250,000 limitation, have been taken by the Foundation without them being specifically identified in the reprograming request. For instance, on page NSF–42 of your budget justification, you show that mathematical sciences special projects were increased by approximately $1.1 million, polymers research was decreased by $600,000. Furthermore, while your reprograming letter identifies an increase of $3.9 million for high-priority research instrumentation in your mathematical and physical sciences directorate, a review of the table on page NSF–42 indicates a $5.8 million increase for these activities.

In the future, will you please provide the committee with reprograming justifications in sufficient detail to identify your proposed changes at the level contained on pages NSF–41 through NSF–49 of your budget justification.

Dr. **Knapp**. I am working with my staff on this problem, and we will provide you those letters.

FUNDS FOR INSTRUMENTATION

Senator **Garn**. In this respect, if I could continue, I might further quote from the committee report:

> The committee views the monitoring of reprogramings to be an integral part of its budget review responsibility and expects all departments, agencies, commissions, boards, and offices covered by this legislation to adhere to the committee's reprograming directives.

In my January 4 response to your reprograming, I noted that I was somewhat concerned that the reprograming plan that you had submitted imposed a set of priorities for the use of the congressional add-on that were not intended. Specifically, the targeting of these add-on funds for instrumentation was not the intent of the committee. Rather, the committee intended that these additional funds be used to increase the total number of grant awards. I further stated that, and I quote:

> I would suggest that these additional funds be merged with the funds available in each of the directorates in order to fund additional, and possibly higher risk, grants—without reference to the issue of instrumentation. This approach, which could provide funding for approximately 100 additional grants, is likely to result in a greater scientific payoff to the Nation.

I note that NSF has not responded, as of yet, to my recommendation contained in that January 4 letter. I also note that your fiscal year 1983 operating plan reflects a heavy emphasis on shifting funds from the congressional add-on to your instrumentation program, notwithstanding the recommendations contained in my letter. I think that the Foundation has placed itself in a cart-before-the-horse type situation, in that your fiscal year 1984 budget request, which contains your revised operating plan, was finalized before you requested the committee's approval for the reprogramings contained in the budget justification.

Now, I certainly understand that the Foundation is under new leadership, and I would hope that this type of problem could be avoided in the future.

Dr. KNAPP. Yes, sir.

NRC REPORT

Senator GARN. In July 1982, the National Research Council issued a report entitled, "Revitalizing Laboratory Instrumentation." This 136-page report contains the conclusions of over 50 scientists and engineers brought together under the auspices of the National Research Council's Ad Hoc Working Group on Scientific Instrumentation. While the consensus of that group was that there is indeed a serious problem of providing adequate instrumentation in university research laboratories, the working group did not, however, conclude on this basis that an appeal for a major infusion of new Federal funds should be the first priority. The working group devoted much of its attention to newer approaches like the management of the university research enterprise that could promote more effective use of existing resources. In fact, the group conluded that:

> Such an approach could lead to a more permanent solution to the problem than the infusion of Federal funds.

In particular, the group focused on solutions that involve the optimization of equipment investment returns by sharing among departments and universities in particular regions and also techniques that would improve the financing and management within universities. In summarizing the findings of the study group, the president of the National Academy of Sciences, Dr. Frank Press, stated:

> The group concluded that improving financial and management techniques and revisions in the policies, mechanisms, and procedures of research support have considerable potential for ameliorating the problem within existing budgetary constraints.

What is your opinion? Do you agree with the summary and fundings of this report and Dr. Press' conclusions?

Dr. KNAPP. My understanding of the instrumentation problem is perhaps not quite that straightforward. I believe that university research has a serious instrumentation problem and that a little shuffling—creative financing perhaps—is certainly not going to solve the problem. It will take an infusion of Federal funds to solve this problem. It is an accumulation of 10 to 15 years of neglect of this particular area, and it certainly can't be solved quickly. The program of the Foundation is not to put forward instrumentation initiatives but to make sure that the funds awarded for the work proposed are adequate to provide the instrumentation necessary to do the work. That approach to the instrumentation problem is one which, over several years, solve the problem.

ADDITIONAL FUNDS NEEDED

Senator GARN. Dr. Branscomb, if you want to comment on any of these feel free to do so.

Dr. BRANSCOMB. I would like to comment.

The scientists brought together in the Research Council group should be commended for not taking the easy way; in a previous time they might have appealed for a massive injection of money. What Dr. Knapp says is consistent with the argument that several forces within the community have led investigators to favor maintenance of their staffs and activities and to delay investment in instrumentation. What needs to be done is to insure that proposals are constructive with respect to their instrumentation requirements and do not postpone those requirements for a sunnier day. The proposed method of management Dr. Knapp has described is more likely to produce the change with minimum cost than would a special add-on exclusively for instrumentation as a stand-alone set of target projects. I don't see his management strategy and the recommendations of that report as in conflict, but I thoroughly concur with his view that this problem will not be solved without additional funds and larger grants.

My colleague on the Board, Roland Schmitt, who is in charge of all science and engineering at General Electric Co., was astonished at the ratio of equipment to operating funds within the typical NSF grant, compared to the GE ratio. In his laboratory, the individual scientist's equipment support in relation to technicians and material and supplies was very different from what it is in the universities. That must be changed if productive work is to be done for maximum benefit from the public investment.

Senator GARN. Dr. Knapp, can you tell the subcommittee any specific recommendations you have in management or policy improvements that NSF is considering to address the issue of instrumentation?

Dr. KNAPP. For instrumentation only, I offer the statement that I just made. NSF will make it the responsibility of program managers to look carefully at proposals to make sure that the instrumentation needs of the proposed research are met and that the funding is adequate for the work to be carried out.

REGIONAL EQUIPMENT SHARING

Senator GARN. Are you undertaking any activities to promote sharing of equipment among departments and universities on a regional basis?

Dr. KNAPP. NSF has several programs of that kind. The Foundation has no new initiatives, but intends to expand initiatives in instrumentation sharing and in dissemination of information. It is important for universities in a region to understand what is available at other universities in the area. Some informal sharing of information is being promoted within the Foundation in these areas.

ENGINEERING INSTRUMENTATION

Senator GARN. Your budget justification indicates that research instrumentation for NSF as a whole will increase by 100 percent between fiscal year 1982 and fiscal year 1984 and by 60.5 percent between fiscal year 1983 and fiscal year 1984. A closer look at the figures contained in your budget indicate that in the field of engineering, you anticipate a 109.2-percent increase in instrumentation funding between fiscal year 1983 and fiscal year 1984.

As you will recall, the fiscal year 1982 Senate Appropriations Committee report contains specific language relative to the instrumentation problem, and I quote:

> The committee recognizes the need for an instrumentation replacement program on a national scale. Information presented to the committee to date, however, indicates that the Foundation has not adequately identified the roles of other Government agencies and the private sector in addressing the instrumentation needs of universities. Additionally, the committee is concerned about the priority process that will eventually be used for the selection of grantees. Because these issues remain unresolved, the committee has not provided any funds for the initiation of this progarm during fiscal year 1982. However, the committee is convinced that a real need exists and, therefore, directs the Foundation to continue developing a plan for an instrumentation program using such funds as may be necessary.

PLAN FOR INSTRUMENTATION

What is the status of this plan, and how have you satisfied the committee's concern about the role of other Federal agencies and the process for selecting grantees?

Dr. KNAPP. I will refer part of that question to Dr. Jack Sanderson, the Assistant Director for Engineering. I will say, before he speaks, that the role of other agencies is important and real. The Department of Defense had a research instrumentation program during the past year. DOD funds, in the amount of $30 million, were set aside for instrumentation at universities. The depth of this problem is indicated by the fact that $600 million worth of proposals were received for that $30 million fund. The need is real and certainly is not met by a $30 million set-aside within the DOD.

Dr. Sanderson?

Dr. SANDERSON. Senator Garn, I can report on several activities carried out to examine the need and to build coordination with other Federal agencies.

First, we have had a thorough review of the instrumentation needs in engineering as part of the deliberations of the Engineering Advisory Committee—some 14 prominent engineers, mostly from academic institutions, but some from industry throughout the country. They agreed that university research instrumentation was the highest priority for engineering itself.

In addition, we have coordinated closely with several other Federal agencies to provide instrumentation jointly and have worked closely with the private sector in having instrumentation made available. For example, we have been closely involved with the Department of Defense in planning and looking at the activities under their special instrumentation program, and we do coordinate on instrumentation requests.

In addition, jointly with the Defense Advanced Research Projects Agency, we have made some facilities available in the area of microelectronic fabrication. So some surplus capability that exists in microelectronic fabrication plants in the Department of Defense have now been available on a no-cost basis to university research teams to carry out research.

Also, we have worked closely with several private efforts in providing additional instrumentation. Dr. Branscomb has not mentioned it, but IBM has made available a sizable amount of equipment for research in the area of automated manufacturing technology. We have participated in the discussions that led up to those proposed awards. We have also been working with other private companies that are making equipment available.

Finally, in the area of NSF's support of instrumentation, we provide equipment through two modes. The first is part of the regular research grant. In the second mode, we run each year a separate award competition for equipment only. This competition for equipment provides a broader sharing of the equipment within the engineering departments of the universities. For the past 2 years, we have required equipment matching funds from other sources. We are getting a substantial contribution to the cost of equipment provided through this particular competition.

PURCHASE OF MINICOMPUTERS

Senator GARN. Thank you very much.

Your budget justification indicates that one of the areas where the instrumentation money will be used will be to provide support for the purchase of minicomputers by individual investigators. On what basis was it determined that the purchase of mini-computers represented a high priority use of these funds?

Dr. KNAPP. The basis is the evaluation of the proposal: the research to be done and the place of automated data acquisition—presumably the use for the minicomputer—in the research plan. I would believe that the choice of the minicomputer, or other instrumentation, is based on the need associated with the proposal. It becomes part of the instrumentation for the research to be done under the grant.

Senator GARN. Dr. Sanderson, did you wish to add to that?

Dr. SANDERSON. We monitored a study by the American Society of Mechanical Engineers. The study looked at the high-priority needs in that branch of engineering. The study, recently released, identified the need for introduction of computer capability, particularly at the individual computer level, as the highest priority issue facing mechanical engineers' design today.

Senator GARN. I personally would like to have one to do my bills.

Dr. SANDERSON. Today, I would like one to do my taxes.

Senator GARN. One of my colleagues in the Senate, who will go unnamed, has a new mini-computer at home, and he was telling me what is possible. He was connected to a service where he could plug in his name and State and it would feed out any news stories about him that day. I said that could be pretty dangerous. It may come back in blank. Nobody may know you exist. [Laughter.]

So we risk that possibility.

Has the Foundation determined what types of equipment, such as minicomputers, could be more appropriately supplied by industry or the universities, and what kind of equipment would most likely not be available to researchers without a Federal investment?

Dr. KNAPP. In the case of the minicomputer, or computers in general, universities are capable of generating substantial discounts from the manufacturers themselves, although not so often outright gifts. Matching funds are common in acquiring computer equipment.

Other types of equipment are many times less likely to have support from the industry which provides them. NSF has done a study in this area and is actively promoting industry discounts for computer equipment. The Foundation is working to bring together computer manufacturers and universities for discussion of discount opportunities.

QUESTIONS FOR THE RECORD

Senator GARN. The next couple of questions I will read to you, but if you could, supply the answers for the record.

What types of studies have you conducted that would help you make these resource allocation decisions and help you set the priorities for your instrumentation program?

Your budget justification indicates that as part of your instrumentation initiative, the universities have accepted responsibility for improving their management of instrumentation and are about to embark on a major educational effort to encourage new financing arrangements, equipment sharing, more responsive university regulatory policies, and adequate maintenance.

Dr. Branscomb, you don't need to write them down. We will give you copies of the questions. Unless you take shorthand.

Next, do you plan to enter into agreements outlining the universities' responsibilities for the procurement and maintenance of instrumentation before providing more new instrumentation funding?

Dr. KNAPP. We will provide answers to those questions for the record.

Senator GARN. All right.

FISCAL YEARS 1982, 1984 REQUESTS

At last year's hearing, I noted that your January 1981 budget requested $75 million for a new program targeted at upgrading the instrumentation at universities and research laboratories. During the course of the fiscal year 1982 budget process, the authorizing and appropriating committees took exception to the manner in which this program was configured and did not approve any funding for it. At last year's hearing, I asked you whether the Foundation had any plans to initiate such a program in fiscal year 1984. The answer was "No." An analysis of the funding levels proposed for equipment and instrumentation during fiscal year 1984, however, indicates that the Foundation is requesting an additional $73.5 million for instrumentation over the fiscal year 1983 level.

How does your fiscal year 1984 instrumentation budget differ from the initiative proposed in fiscal year 1982?

Dr. KNAPP. I will ask Dr. Kent Wilson to respond.

Dr. Wilson. The original $75 million was a targeted program, separately managed, in which NSF intended to ask the universities to make their own priority judgments. NSF would respond to perhaps one or two proposals per university. The program was aimed at major pieces of equipment costing about $0.5 million.

The present emphasis on instrumentation is not focused in that way. As Dr. Knapp has said, it is closely coupled to the individual research proposals. Both programs speak to facets of instrumentation need but the current proposal is quite different.

Senator GARN. Thank you.

MATCHING FUNDS

During last year's hearing, I also asked the Foundation whether it would be necessary to develop a program requiring matching grants from industry in order to truly address the instrumentation needs at universities. In response, the Foundation states, and I quote, "Many analysts and observers agree that the university research instrumentation problem will be solved only with strong private sector participation."

What specific plans have you made in conjunction with your fiscal year 1984 budget request to develop such a matching program?

Dr. KNAPP. Dr. Wilson, will you respond to that question, too?

Dr. WILSON. The major emphasis is in computers. NSF has been talking to a large number of computer manufacturers to see their response to discounts. NSF also has talked with SIM, the Society of Instrument Manufacturers, to see whether this type of approach could be used. These discussions are continuing.

Senator GARN. What goals and objectives have you established for industrial/local match during fiscal year 1984?

Dr. KNAPP. The President's young investigator program supports young investigators at universities in fields where there is strong faculty need. The program provides $25,000 as an award to a young investigator, with additional funds matching private funds up to a maximum of $100,000 for the research carried out by the young investigator.

In engineering and chemistry, 50-percent matching is required for special equipment funds. The requirement applies not only to industry, but also to university funds.

CREATIVE FINANCING

Senator GARN. Last year I asked the Foundation what it was doing to encourage State and local governments, as well as universities, to explore new and creative ways of financing equipment. Whenever I see the term "creative financing," it instantly refers me back to my hat as chairman of the Banking, Housing and Urban Affairs Committee. If ever there has been a plague on my life, it is financing, the last 2 years, with high interest rates and dealing with creative financing. There is an incredibly different definition of what creative financing is out in the market.

But anyway, you responded that the Foundation had been looking into the advantages and pitfalls of various techniques and had begun to encourage more thinking about this matter by carrying on a series of discussions with members of the research community. I also asked whether NSF intends to collect and disseminate examples of successful financing programs. In response, you stated, "The idea of disseminating examples of successful cases is a good one and we will pursue it."

Has NSF pursued and made available any such examples of the successful use of creative financing? Or are you still pursuing it?

Dr. KNAPP. I am not certain whether NSF has published examples. However, the Foundation has sponsored of several meetings on instrumentation. One took place in Philadelphia last fall, just after I joined the Foundation. The financing of research instrumentation and facilities was discussed in a meeting of many university officials. At that meeting, several successful cases of research instrumentation funding through local financing were discussed. And problems resulting from financing instrumentation in different ways were thoroughly discussed. Within the university community, the potential for this approach to the problem is being widely disseminated.

Senator GARN. You also said, "The Foundation's Office of Planning and Resource Management will undertake to develop, or fund the development by others, of a guide that describes some of the techniques with case histories."

What is the status of this development effort?

Dr. KNAPP. Dr. Wilson, will you answer?

Dr. WILSON. That project is in abeyance; we have not made much progress in collecting case histories and publishing them.

SECTION 222 OF 1981 ACT

Senator GARN. I also questioned you about the potential impact of section 222 of the Economic Recovery Act of 1981, which permits an increased deduction for manufacturers who donate scientific research equipment to institutions of higher education. In response to that question, you noted that OMB and the Foundation were conducting a study of the effects of section 222. You further noted that the study results would be used in the preparation of the President's budget for research and development in fiscal year 1984.

What were your conclusions from this joint study, and how have the findings of this study been incorporated into your fiscal year 1984 budget request?

Dr. KNAPP. Dr. Wilson?

Dr. WILSON. Senator Garn——

Senator GARN. We better get you up closer.

Dr. WILSON. Mr. Green can respond.

Mr. GREEN. OMB, in the initial deliberations on the budget, took NSF's work into account. But the tax law had been in effect less than a year at the time we submitted NSF's findings. The data suggested some movement toward increased deductions for manufacturers' donations, but there weren't enough data from which to draw conclusions.

Dr. BRANSCOMB. Senator, may I comment about that tax bill? I would like to say that the industries producing instrumentation important to universities but whose primary market is the commercial world, are strongly influenced by that provision to be more generous to the universities. It is a real and significant incentive. The computer industry is one of those.

Most of the instruments that scientists use, other than information processing equipment, are scientific instruments with technical names. They often are generated by small companies whose only market is the research market and universities. So a large part of the research partnership does not find it terribly attractive to give away its products, even though it doesn't cost them much after taxes, because they are eroding the size of this limited market by doing so. At the moment, the computer industry is being rather generous, but all these other small businesses making instruments really do need the revenue.

PROPOSAL REVIEW SYSTEM

Senator GARN. Your budget justification states:

> The Foundation's proposal review system is a competitive, national evaluation of research ideas, designed to select and fund those projects at the highest scientific promise.

I certainly agree with the appropriateness of the peer review process to make such quality decisions. I also believe that no process is beyond question or improvement. For example, a study conducted by the National Academy of Sciences on peer review concluded, among other things, that:

> The Foundation should consider replacing its single rating scale with separate rankings of each proposal for such criteria as proposal quality, expected scientific contribution, originality and the investigator's past track record of performance.

What problems would be encountered if the Foundation adopted such a policy?

Dr. KNAPP. The Foundation is evaluating those ideas. In fact, the evaluation was instigated by your committee in discussions of the post-performance evaluation of proposals and of renewal proposals. The Foundation's Management Council has discussed possible changes in review procedures that would allow ratings on previous performance to be made a part of the grant award process.

Senator GARN. Has the Foundation attempted to pilot test such a change in the peer review process?

Dr. KNAPP. I imagine any change would be pilot tested; it has not been to date.

Senator GARN. Wouldn't such a change result in more consistency in addressing the various components of each proposal and thus provide a better basis for making comparison judgments?

Dr. KNAPP. I think it would, but I am not familiar with the proposed changes.

Senator GARN. Do you see any disadvantages of providing this type of structure in addition to the general evaluative comments made by the reviewers?

Dr. KNAPP. The only possible disadvantage I can see is the additional burden placed upon reviewers, but I don't think it will be excessive.

PERCENT OF PROPOSALS FUNDED

Senator GARN. According to your budget justification, the Foundation funded approximately 47 percent of the proposals submitted during fiscal year 1982. In fiscal year 1983, you expect to fund 42 percent of the submitted proposals, and in fiscal year 1984, 40 percent.

Does the consistently declining percentage indicate a policy decision on the part of the Foundation to fund a smaller percentage of the proposals over time?

Dr. KNAPP. I don't think so. These projections are based upon an assessment of the needs of the scientific community. Since I became Director, I have not been aware of any conscious thought to reduce the number of funded proposals. In fact, I have thought NSF would have a small increase in the number. I have said in previous testimony that NSF will be increasing the number and size of grants awarded to take into account the instrumentation problem and to expand the total number of investigators in the research enterprise.

Senator GARN. Well, of course, I did read percentages. There is a small increase in the number. In fiscal year 1982, you made 13,025 awards. In fiscal year 1983, you expect this to increase by 178 awards, or 1.4 percent. Your estimate for fiscal year 1984 indicates an increase of 145 awards, or approximately 1.1 percent. You have had more. The percentage, obviously, goes down because you had a higher number of requests. But do you believe that a 1-percent increase in the number of awards is an appropriate plan for the Foundation during the next several years?

Dr. KNAPP. Considering the depth and severity of the instrumentation problem, I don't think we can make science really healthy in this country with an increase of only 1 or so percent in the number of awardees. However, there is some indication in some of the sciences that grants are starting to cover more than just a principal investigator and a graduate student; that is, more group grants are being requested. In some of the scientific disciplines the group is the standard way of doing business. Several senior investigators are supported on one grant. That practice is hidden in the statistics you see.

INCREASED SIZE OF GRANTS

Senator GARN. In February, Jay Keyworth authored an editorial in Science on the administration's R&D priorities. In that article, he made a statement that I would like to explore in more detail. Specifically, he stated:

> Just as we have not allocated these funds for the usual reasons, we do not expect them to be used in the usual ways. Naturally, the various disciplines would welcome infusions of money to support more projects, say the next 10 or 15 percent of the proposals—all good—that missed the funding cutoff. But the President has not allocated these growth funds to support next-best research. The real return on this Federal investment will come from focusing on the best projects. . .

This philosophy of increasing the average size of grants rather than increasing the number of grants is certainly reflected in NSF's fiscal year 1984 request. Thus, while grant resources available to NSF have increased by about 19 percent, the number of grants is expected to increase by about 1 percent, as we have discussed.

What do you expect to, if I can use the term, "buy" from a scientific standpoint by increasing the size of grants?

Dr. KNAPP. I believe what NSF buys is real quality in the research it supports. Top-quality, first-line research can't be done with 15-year-old equipment. Research can't be done and graduate students can't be trained if there isn't enough money in the grant to support graduate research assistants. One of the reasons that NSF supports research in universities is because universities couple research results and research training in a way important for the country's future. The personnel resources produced are extremely important. In general, graduate students in the sciences are supported during their research years by research assistantships at the universities. And the assistantships are funded from the research grants.

In mathematics, a discipline in which the problem was acute, the number of research assistantships funded by grants had virtually declined to zero during the past 10 years; the grant size had been kept very low. Grants were used only to support research by the principal investigators. Very little support was available to graduate students and postdoctoral fellows. In NSF's request for mathematics in fiscal year 1984, it is proposed that the increases be used to expand grant size so that more graduate students in mathematics can be supported in the universities.

INCREASE FOR INDIRECT COSTS

Senator GARN. I notice that the number of senior scientists supported by NSF research awards, according to your estimates, will be approximately 13,183 in fiscal year 1984. This represents an increase of only 3 percent, while the number of years of scientific support will increase by only 5.8 percent.

In fact, the largest percentage increase is in the area of indirect costs for grants, which includes supplies, publications, consultants, computer subcontractors, and travel. Indirect costs are estimated to increase 8.9 percent from fiscal year 1983 to fiscal year 1984. This is against an expected inflation rate of around 5 percent.

One problem I have with your conclusion to increase grant size is the basic premise that we will be funding the best science in light of these percentage increases. As you know, the National Academy of Sciences has found that somewhere between 24 and 30 percent of NSF funding decisions would be reversed—that is, NFS selected projects would not be funded and others would—were the ratings made by another equally qualified group of reviewers.

Doesn't this cast some doubt on your assumption that we are invariably selecting the best projects—an increase in grant size is funding the best projects—when you are getting a higher percentage going to indirect costs than directly into the research?

Dr. KNAPP. I would like to provide detailed numbers for the record. However, it is not my impression that indirect costs are expected to increase as a percentage of the total grants as you indicate. We will look at those numbers.

Senator GARN. I would appreciate it if you would.

[The information follows:]

NSF SUPPORT FOR INDIRECT COST

	Fiscal year 1983	Fiscal year 1984	Percent increase
Indirect costs	$267.1	$291.0	8.9
Total NSF	1,097.2	1,292.3	17.3

The NSF budget estimate increases by 17.8 percent from fiscal year 1983 to fiscal year 1984, whereas support for indirect costs increases by only 8.9 percent during this period.

PERCENT OF INDIRECT COSTS TO TOTAL NSF BUDGET

[In millions of dollars]

		Percent of indirect costs
Fiscal year 1982:		
Indirect costs	$246.0	24.6
Total budget	999.1	
Fiscal year 1983:		
Indirect costs	267.1	
Total budget	1,097.2	24.3
Fiscal year 1984:		
Indirect costs	291.0	
Total budget	1,292.3	22.5

Indirect costs as a percent of the total NSF budget have decreased from fiscal year 1982-fiscal year 1984.

Senator GARN. Obviously, what I am driving at is I am certainly interested in what you are trying to accomplish. I agree with what you are trying to accomplish. But I have also seen personal examples, in my own home State, and over several years, where increased grant size didn't mean necessarily increased investigation and study, but rather to improve the comfort of the workplaces. I related this in a hearing a few weeks ago. I am very familiar with the artificial heart situation in my own State. I know Dr. Culph very well. Over the years I have seen the facilities and equipment that Dr. Culph worked with at the University of Utah. After one facility, which was not the greatest in the world, burned down, he was out in an old abandoned hospital in Salt Lake City. It was at this location that he worked with the cattle and sheep. I don't mean that it wouldn't have been helpful to have somewhat better facilities than he had at the time. What I am driving at is reducing the desire for gold plating

I will try to give you all the money that we possibly can, within the budget constraints, that is required for scientific purposes. That is why I am asking you to supply information for the record. I want to minimize the indirect costs as much as possible and use the funds for the lofty goals that everybody agrees we want to achieve.

Dr. KNAPP. NSF really shares your concerns and goals.

GOLD PLATING

Senator GARN. May I use the Hart Building as an example of gold plating here in the Congress. It is unnecessary. I chose to stay right where I am here in the Dirksen Building. I am adequately taken care of, and moving into the Hart Building will not improve my performance as a Senator at all. We might be better off to sell it to the Hyatt Regency. That atrium would be wonderful. If we put some exterior elevators on it you wouldn't be able to tell the difference.

Dr. BRANSCOMB. Speaking as one of the industrialists on the Board, I don't think any one of us believes we are anywhere close to gold plating in the universities. One of the areas that has atrophied away during the past decade of severe retrenchment is the technical support facilities—the machine shop, the glass blower, the other efforts that prepare for leading-edge work. The universities really do need to provide that kind of technical support for leading edge work. While careful stewardship of the funds is obviously necessary, I don't believe we are assisting well-supported universities to the point of luxury. We are far from that point.

Senator GARN. Oh, I would agree with that. But gold plating, I suppose, is relative. Just this last fall I once again happened to be in Cambridge and Oxford, those 500-, 600-year old buildings. I don't think anybody would dispute the quality of education there. I can go back to my own grade school and wonder how I got educated and learned to read and write before they did multihundred thousand dollar improvements to the buildings that came in the future. The only thing is I can spell, and some of the kids that attend the building that all the money was spent on, can't. That is really what I am driving at.

No, it isn't to the luxurious state at all. But we can all watch and see the money is better spent.

I should point out that even among those proposals rated by NSF in the top 20 percent of all proposals, a full 20 percent of these would not have been selected for funding by a different group of reviewers.

There is one other point I would like to make on this issue. The advancement of science may depend more on the number of investigators and the divergent view and approaches of these scientists. Increasing the number of grants may also provide an opportunity to fund young investigators and higher risk proposals. The narrative in your budget justification recognizes the importance of the diversity of researchers when, in reference to graduate students, you state:

> In this apprenticeship role, they perform a vital function in the conduct of academic research and, most importantly, infuse a vitality and fresh perspective in this research which is critical to its quality and innovativeness.

For whatever it is worth, on this judgment between grant size and number of grants, it is obvious that a lot of great and wonderful scientific discoveries have been made in areas that were not expected and certainly were not funded. Many were made by somebody who had never been heard of previously. I guess I am more of a risk taker and would probably branch out into funding more of the young investigators and the proposals that may not appear to have as much promise as others. I would hope that these would turn out to have significant merit. Those are judgments, however, that I have to leave to those of you who have the training.

ROLES FOR NSF OUTLINED

In a March 22, 1983, letter to the National Commission, Dr. Branscomb, on behalf of the National Sciences Board, listed a series of appropriate and inappropriate roles for NSF. Could you please supply that letter for the record?

Dr. BRANSCOMB. I would be happy to do so, sir.

[The letter follows:]

LETTER FROM LEWIS M. BRANSCOMB, CHAIRMAN, NATIONAL SCIENCE BOARD

March 22, 1983

Dr. Cecily C. Selby
45 Sutton Place, South
New York, New York 10022

Dear Cecily:

In our phone conversation last week I promised to provide you with a summary of the Board's current point of view on the NSF role in science and engineering education, particularly concerning its role in precollege education. This may be helpful as background for our joint meeting on May 18.

We had a discussion of this subject at our February Board meeting in preparation for testimony that I would give the following day before Mr. Walgren's Subcommittee on the NSF 1984 Authorization. This particular hearing, where Bill Coleman also testified, dealt specifically with the science and education issue and also focused on the precollege area.

Let me emphasize at the outset that the following summary should not be taken as an attempt to constrain the Commission's deliberations in any fashion. Rather, I would like to share our current views with the Commission to see how our perspectives mesh.

Our Board discussion last month did not attempt to define specific programs or projects to implement existing policies, since there are a great many such proposals now under discussion and we hope the Commission will provide us with a reasonably specific framework of advice within which specific programs and projects can be developed for the future.

What the Board did was review our earlier policy statement and some recent thoughts from both Ed Knapp and me. Putting the role of the National Science Foundation in precollege science education in a broader context, the Board informally concluded that:

- The Foundation should act in ways that utilize its unique talents and resources, utilizing the support and knowledge of the scientific and engineering community with whom the Foundation has worked successfully for over 30 years;
- The Foundation must continue to focus on research-level education because of the Federal Government's primary role in supporting basic research in universities and the Foundation's unique expertise in carrying out that role;
- At the same time, the Foundation must seek to strengthen other aspects of scientific and engineering education, particularly precollege science and math education, on which scientific and engineering research depend;
- In selecting precollege science and math activities, the Foundation should seek those activities in which it can exercise relatively great leverage.

In reaching these conclusions, the Board considered the statutory authority and subsequent history and experience of the Foundation. Because this background may also be helpful in your own deliberations, let me provide a summary, as well as criteria that were considered for an NSF role.

The Foundation's role in precollege science education derives from our statutory authority, the things we do well, and our evaluation of priority needs for appropriate Federal activity within the scope of our statutory authority. I will consider each of these topics in turn.

Statutory Authority

Responsibilities for research are placed side by side with responsibility for programs "to strengthen scientific research potential and science education programs" in the first sentence describing our functions (42U.S.C.§1862, Sec.3.(a)(1)).

In addition, section (3) calls out specific authority to: "award scholarships and graduate fellowships" and "to foster...the use of computer and other...methods...for research and education in the sciences."

Finally, the statute says that "the Board and the Director shall recommend and encourage the pursuit of national policies for the promotion of basic research and education in the sciences."

Thus the conjoint responsibility in research and education is clear.

The statute is also even-handed and unspecific about the levels of education to which the Foundation should accord authority. However, the coupling of "research and education" suggests a priority for education that is associated with research training, in other words college and university level educational problems. Obviously the majority of the Foundation's educational activity in science and engineering is at this level. Our policy of investing primarily in university laboratories for the conduct of basic research is intended to assure the strength of the graduate schools of those universities. Our research grants provide financial support for over 10,000 graduate students, in addition to our fellowship program. Thus, our principal educational activity is at the post-kindergarten through grade 12 level.

However, it is very clear, from legislative history, from prior activities of the Foundation, and from the impact that an inadequate precollege educational system can have on college education and research capability that a significant priority must be accorded to science education at the precollege level.

National Science Board Policy

In the Board's statement of March 20, 1981, we said, "The Board can see a crisis coming of serious proportions" in precollege math and science education. While agreeing that public schools are primarily a local responsibility, the Board "is convinced the Foundation has an indispensable catalytic role it should not abrogate, even if the level of investment is severely curtailed."

On August 20, 1981, the Board issued its statement on NSF activities in Science and Engineering Education after careful study and deliberation.

We identified these priorities:

1. Unique responsibilities--
    a. Support for research level education.
    b. Evaluation and monitoring of the national science and engineering education system with respect to... human resources...to meet national needs in science and engineering education.

2. Leadership in identifying areas of special concern--

   To "encourage other agencies, state and local government and private organizations to meet those needs," and

3. Selected high-leverage activities--

   For NSF to "intervene in selected areas where significant improvement in educational outcomes is possible within limited investment."

The Director's implementation statement of the same date identified for the precollege area (with emphasis on setting examples and testing prototypes)

1. The Commission - as a means for taking a leadership role in a voluntary context and

2. Several specifics:

   a. Materials for science teachers to convey new knowledge and technology...

   b. Interaction between science teachers and... colleges, universities and industries, and

   c. Regional resource centers for needs assessment in-service training, encouragement of science interests in minority and women and local leadership development.

Based on these statements we believe there are some criteria that could readily be applied to NSF's precollege science education activities.

Criteria for NSF Role in Science Education

Primary and secondary education in the United States is a vast, decentralized enterprise. In terms of dollars, NSF necessarily will always have a small role, even within the context of the Federal Government. The following criteria can be inferred from this fact and from the statutory and historical role of the Foundation. NSF activities at the precollege level may not meet all of the criteria listed here, but should be selected and designed to meet as many of them as possible. An activity should:

- Exert high leverage. A corollary is that appropriated funds must be sufficient to ensure that the activity will have the intended impact;

- Demonstrate leadership in the national interest through example-setting, prototype testing, and the like;

- Take advantage of NSF's access to the Nation's laboratories, colleges, and universities;

- Be as flexible as possible in order to be receptive to new and unanticipated ideas, and encourage innovative projects involving qualitative improvements in science education;

- Be designed so that selection of individual projects is based on excellence and the evaluation of scientific merit is based on peer review;

- Promote the involvement of state and local governments, the private sector, and professional scientific and engineering societies and organizations.

Examples of Possible Program Activities

1. Leadership efforts, for example through the NSB Commission;
2. Stimulating the improvement of new materials to help teachers keep up with science and stimulate student interest;
3. Assisting institutions capable of assisting teachers both with materials, technology, and content;
4. Bringing public recognition to activities and programs in science education of unusual merit;
5. Assisting in the development of institutions, for example at the regional level, to provide scientific and technical support to science education;
6. Enhancing access of secondary schools to college, university, and industry resources in science and engineering;
7. Working with colleges, universities, and schools to facilitate cooperation at the high school/college interface;
8. Cooperating with the educational community to develop techniques for measuring educational achievement and the setting of educational goals and standards by states and communities;
9. Providing a flexible capability to respond quickly and effectively to opportunities to encourage innovative approaches to cooperation between schools, their communities, professional societies, businesses, unions and/or governmental bodies at all levels.

Examples of inappropriate roles for NSF would be:

1. Formula grants, money to relieve financial burdens on schools;
2. Formula-based salary increments for teachers;
3. Block grant support for teacher colleges.

Such activities are not necessarily wrong for the Department of Education; they are inappropriate for NSF.

Activities inappropriate for any Federal agency are:

1. Production and gift or sale of educational materials that are or readily can be available from private sources;
2. Setting mandated Federal standards of achievement in local schools; and
3. Dictating curriculum to local schools.

All of these examples I have given are consistent with Board policy and indeed are largely identical with the Board-approved Director's Implementation Statement of August 20, 1981.

They are also consistent with the views of the Senate Appropriations Subcommittee on HUD-Independent Agencies received February 17, 1983, from Senator Garn.

I hope that the information about recent Board consideration of science education is useful to you. Speaking for the other members of the National Science Board, I want to thank you and the other Commissioners for the great dedication of effort you are making to this very important problem. Your efforts to date have already brought a great enhancement of public attention to this issue, which is now gaining the attention of the citizens of the Nation. We look forward to your recommendations and assure you that the Board will attempt to act promptly upon them.

Sincerely yours,

Lewis M. Branscomb
Chairman

CHAIRMAN'S VIEWS

Senator GARN. I notice that your letter states that the definition of appropriate and inappropriate roles for NSF are consistent with the views of the Senate Appropriations Subcommittee on HUD-Independent Agencies received February 17, 1983, from Senator Garn.

Could you, Dr. Branscomb, explain how your concept of NSF's role corresponds to the six areas I outlined in my letter: Materials development, public awareness and motivation, teaching and materials demonstrations, evaluation of materials and teacher training, research in learning and cognition, and high-technology applications?

Dr. BRANSCOMB. I would be pleased to. It is perhaps presumptuous to make a categorical statement they are also consistent. After all, you wrote the letter, and I am not positive I know what you had in mind.

As I read these six areas, I saw no conflict between them and the criteria described in my letter for judging what would be an appropriate NSF activity. In fact, looking even at examples that I put in this letter in order to illustrate how those criteria might plan out, I find a substantial congruence. I tried to be careful in this letter, and the Board wished to be careful in its discussion that led to it. We did not wish to dictate to the commission on what their recommendations should be, nor to interpret the Board's role to the commission. It did seem to me, however, that your letter gave proper emphasis to activities that would draw upon the Foundation's excellent relationships with the scientific and engineering community, upon the Foundation's tradition of funding competitive, peer review grants, and upon the Board's concern with the content of science teaching. Indeed, the issue of learning and cognition makes up an important area of research within the biological and behavioral sciences. So I saw no conflict in principle.

The Board, after it approved the fiscal year 1984 proposal and fiscal year 1983 plan last fall, delegated to the Director the task of working out the details of the fiscal year 1983 program to your satisfaction. I did not intend my letter to imply which of the activities is appropriate for the expenditure of a modest $15 million. That issue is a proper matter for dialog between the Director and your committee.

Senator GARN. There is no objection to the approach you have taken.

Dr. BRANSCOMB. Not on my part, sir. If I had interpreted your letter as saying that this $15 million should be spread over any significant number of areas, I think the Board would have wanted to say, "Please remember the difficulty the Foundation seemed to be in during the declining years of its science education program, when NSF had 27 activities and when the Board began to doubt it had enough leverage over the problem."

Senator GARN. There was one scientist in our own university who thought that is what I meant, that that $15 million should be dropped by an airplane and spread all over the country. I am glad you understand that was not the intent.

ADDITIONAL QUESTIONS

Gentlemen, I have 60 pages of questions for you for the record. I wanted to hurry and I didn't want you to panic because I know you are going to New York. I also have to go and speak to a conference of State legislators. I don't think they are going to like what I am going to tell them. Nevertheless, I am going over to speak to them.

Senator Huddleston could not be here today but will have some additional questions for you for the record.

So, we thank you very much for coming. Of all the questions I have to ask in the subcommittee, these are probably the most difficult. You may think you are at a disadvantage sitting out there. I do understand finance and housing and a lot of other things, but with a total lack of background in science, you must understand I have a hard time understanding the questions, let alone the answers. So we appreciate your indulgence in being here.

[The following questions were not asked at the hearing but were submitted for response for the record:]

QUESTIONS SUBMITTED BY SENATOR GARN

PRESIDENTIAL YOUNG INVESTIGATOR AWARDS

One of the new activities you intend to initiate during FY 1984 is the Presidential Young Investigator Research awards. At one point in your budget, you state that this initiative will require $6 million during FY 1984 (STIA -7). At another point in the budget (NSF-21), you note that this program will be approximately $6 million.

Question: To what extent will the actual amount obligated during FY 1984 be contingent upon matching funds from private sources, particularly industry?

Answer: After much discussion and advice the details of the program have been altered. As now structured minimum awards will consists of $25,000 of Federal funds. The Foundation will also provide up to $37,500 of additional funds on a dollar-for-dollar matching basis to contributions from private sources, resulting in total support of up to $100,000 per year per award. Funding of 200 awards at the minimal level would call for the obligation of $5 million of FY 1984 funds. Should industry participate at the maximum level ($7.5 million, this could technically require the obligation of $12.5 million of FY 1984 funds. However, this situation is not expected to occur because of the degree of industry participation and budget constraints.

Question: Under the assumptions in your budget, approximately $30,000 of Federal funds and $30,000 of matching funds would be made available to each of the 200 grantees selected under this awards program. How was the $60,000 grant size level arrived at?

Answer: As indicated above, the matching provisions have been changed. Present planning contemplates total individual awards ranging from $25,000 to $100,000. The grant size level proposed was an estimate based on past experience.

Question: Do you conceive of this program making one-time one-year awards to each of the recipients or would it be possible for a recipient to receive the award for a period longer than one year?

Answer: It is planned to make awards for up to five years based on an annual determination of satisfactory performance and subject to the availability of funds.

Question: What is the objective of this program?

Answer: The objectives of these awards are: (1) to assure the highest quality and relevance in science and engineering education in U.S. colleges and universities; and (2) to relieve shortages of highly qualified faculty in science and engineering fields.

Question: How will young investigators be selected for the awards?

Answer: Awardees will be selected by means of a two-stage evaluation. The first of these would be a peer review conducted by the research directorates responsible for the disciplines in question. Finalists would then be evaluated by a panel of eminent scientists and engineers.

Question: What mechanism will the Foundation use in order to assure that there is some balance between the various Directorates in terms of the number of awards made in each disciplinary area?

Answer: The staff's best estimate of faculty development needs and an informal survey of eligible institutions have led to the following tentative allocation of the 200 awards; up to 100 in engineering, up to 60 in mathematical and physical sciences, up to 25 in the biological sciences, and up to 15 in the astronomical, atmospheric, earth and ocean sciences. The function of the panel will be to recommend the final distribution consistent with the highest quality across scientific fields.

Question: How much of the estimated $60,000 per year per award will be applied for salaries and how much for other R&D uses?

Answer: It is estimated that salary costs would include approximately $5,000 for summer compensation of the presidential young investigator and $30,000 for other staff, such as graduate and postdoctoral students, and support staff. In accordance with normal academic practice, summer compensation is based on two-ninths of academic year salary. The academic-year salary itself of the young investigator must be borne by the nominating institution. The balance would be directed to other usual research expenses.

UNDERGRADUATE COLLEGE RESEARCH SUPPORT

Another initiative that you intend to undertake during FY 1984 is your Undergraduate College Research Support Program. Your justification states that up to $3 million will be directed to those colleges that do not award the Ph.D. but provide many graduate students for our nation's universities. The justification further goes on to state that such support will be made available to undergraduate college faculty and major academic institutions, government research facilities and instrumentation, and research supported at undergraduate colleges.

Question: If the program is geared towards supporting colleges that "do not award the Ph.D.", why have you included undergraduate college faculty at major academic institutions and government research facilities as eligible for funding?

Answer: The Undergraduate College Research Support is indeed aimed at faculty at predominantly undergraduate institutions. On page NSF-27 this is outlined as follows:

> "The program will emphasize independent research by faculty at these predominantly undergraduate colleges, using the physical resources of major university, industrial or government research centers, and will encourage the inclusion of advanced undergraduate students as part of the research team. Funds for essential permanent equipment will also be provided. This program will thus help improve the quality of the research environment at small institutions which serve as major resources of future scientists, engineers and technicians."

Question: Shouldn't major academic institutions have sufficient funds to provide instrumentation and research support to their undergraduate faculty?

Answer: This program is not intended to provide instrumentation and other research support for major university faculty. Major research universities also have problems with providing adequate equipment for both undergraduate research and instruction, but this programmatic effort is aimed at those institutions, which as a group, are even less well equipped.

Question: How do you intend to select recipients of these awards?

Answer: Details of eligibility and selection criteria are presently being developed at the Foundation. These will clearly lay out the requirements with regard to application, peer review, and items eligible for support.

Question: How much of the $3 million would you estimate will be made available to undergraduate college faculty at major academic institutions and how much will be made available for government research facilities?

Answer: The intention is to provide support for faculty at predominantly undergraduate institutions. Any funds to major research institutions and government facilities would be for use of facilities, materials, and other assistance in carrying out the research project. We estimate that the majority of the funding will go directly to the predominantly undergraduate institution.

Question: You also note that funds for essential permanent equipment will also be provided. How much of the $3 million would you anticipate to use for permanent equipment?

Answer: We are still in the developmental stage and it is not yet clear exactly what proportion of the funds will be allocated for permanent equipment.

Question: What types of equipment do you envision purchasing under this program?

Answer: In general, equipment will be limited to small-scale equipment, essential for conducting research, and leading to significant improvement in the undergraduate research environment.

Other work in progress is studying foreign experience with tax incentives for R&D in selected high-technology sectors. We are about to solicit proposals for further work comparing tax provisions for R&D and innovation in the U.S., Japan, and Germany.

"CREATIVE FINANCING" OF RESEARCH FACILITIES

Question: Last year, I asked the Foundation what it was doing to encourage State and local governments as well as universities in exploring new and creative ways of financing equipment. You responded that the Foundation had begun to encourage more thinking about this matter by carrying on a series of discussion with members of the research community. I also asked whether NSF intends to collect and disseminate examples of successful financing programs. In response, you stated, "The idea of disseminating examples of successful cases is a good one and we will pursue it."

Has NSF published and made available any such examples of successful use of creative financing?

You also stated that, "The Foundation's Office of Planning and Resources Management will undertake to develop, or fund the development by others, of a guide that describes some of the techniques with case histories.

What is the status of this development effort?

Answer: The question of developing and encouraging new ways of financing academic research equipment was discussed not only within the Foundation, but also, because of its government-wide importance by the Interagency Working Group on University Research Instrumentation. The latter group includes, among others, the Departments of Defense, Health and Human Services, and Agriculture, the National Aeronautics and Space Administration and NSF. A group of organizations representing the higher education research community has also taken a great interest in this question. They have submitted a proposal to examine the role of debt financing for research equipment; to identify and evaluate opportunities for improving the procurement, utilization and maintenance of university research equipment; and to determine what impact newly enacted tax incentives have made on the donation of research equipment by the private sector. The project plan provides for widespread dissemination of the results of the study. The proposal is now in the final stages of review, with funding for the effort to be provided by NSF and other members of the Interagency Working Group.

Question: I also questioned you about the potential impact of Section 222 of the Economic Recovery Tax Act of 1981, which permits an increased deduction for manufacturers who donate scientific research equipment to institutions of higher education. In response to that question you noted that OMB and the Foundation were conducting a study of the effects of Section 222. You further noted that the study results would be used in the preparation of the President's budget for research in FY 1984.

What were your conclusions from this joint study?

How have the findings of this study been incorporated into your FY 1984 budget request?

Answer: In July 1982, the Foundation conducted telephone interviews with the top officials of eleven industrial firms and asked about their plans for R&D equipment donations. The interviews were part of our early assessment of several of the R&D provisions in the Economic Recovery Tax Act of 1981. Spokesmen for six of the firms said they had increased or planned to increase their donations, citing other factors as well as the tax incentive. Treasury estimates a revenue loss of less than $5 million per year as a result of Section 222. For a number of reasons (especially lack of data and the fact that specific IRS regulations are not yet written) an estimate of the size of the impact of Section 222 is difficult to make.

In the FY 1984 budget request, the Foundation is proposing an increase of 61 percent over FY 1983 in its support of research instrumentation. This level was justified by assessments of instrumentation needs by each scientific and engineering research program in the Foundation.

INTERNATIONAL SCIENTIFIC COOPERATION

Question: On September 28, 1982, Drs. Branscomb and Slaughter issued a policy statement on international cooperation that was adopted by the National Science Board at its meeting on September 16-17.

Could you please include a copy of this statement in the record at this point?

Have there been any modifications to this policy statement since its adoption in September?

Answer: A copy of the NSB statement is attached. There have been no changes made to the statement since it was adopted.

STATEMENT ON SCIENCE IN THE INTERNATIONAL SETTING
AS ADOPTED BY THE NATIONAL SCIENCE BOARD
AT ITS 238TH MEETING ON SEPTEMBER 16-17, 1982

The United States is at a critical point in its international scientific relationships:

- American scientists no longer lead in every field of science and U.S. industry is significantly challenged in many areas of technology.
- The global nature of many scientific problems, the resolution of which may significantly influence the future well-being of U.S. society, requires increased international cooperation and a coherent approach for successful study.
- The increased scale and complexity of many modern scientific projects requires facilities and operations whose costs strongly suggest the utility of international coordination, sharing and, in some cases, cooperative funding.
- Foreign policy considerations play an increasingly important role in the conduct of international scientific activities.
- Science and technology are becoming increasingly interdependent, and the national security implications of technology transfer have led to increased discussion of the need for additional controls on the international scientific communication process itself.

In view of the importance of these issues and their potential impact on the overall health of U.S. science, the National Science Board has addressed the broad topic of "Science in the International Setting." This statement expresses the Board's present policy and consolidates and extends a number of past Board actions on this subject.

IMPORTANCE OF INTERNATIONAL SCIENTIFIC COOPERATION

Scientific interaction at the international level is an essential element in the continued vitality of science. Historically, the Nation has profited greatly from its positive stance of encouraging outstanding scientists from throughout the world to be aware of and participate in our scientific activities and encouraging U.S. scientists to travel and interact closely with scientific projects in other nations.

There are certain fields in which international cooperation and access are essential to the effective conduct of research because the scientific questions being addressed are inherently global in nature. Examples include research related to climatology, oceanography, space applications, health, population and resource studies, acid rain, carbon dioxide buildup and heating of the atmosphere. Many of these issues are of serious concern to the future well-being of our citizens, as well as to those of other nations. Many disciplines, such as plant sciences, anthropology, and the geophysical sciences, require access to scientific sites in foreign areas.

The cost, scale and complexity of scientific facilities in many disciplines, such as high energy physics and astronomy, provide strong incentives for nations to share in the planning, financing, and use of such facilities.

The value of international scientific cooperation is by no means limited to the use of large facilities. Individual scientists in specialized fields often find international collaborative efforts to be of signal importance in facilitating the advancement of their fields.

SCIENTIFIC COOPERATION WITH VARIOUS NATIONS

The objective of maintaining the vigor of the U.S. research effort requires a broad, world-wide program of cooperation with outstanding scientists in many nations.

Cooperation with the industrialized democracies, such as OECD members and our NATO allies, is clearly of great value to the economic well-being and industrial capability of our own Nation as well as theirs. These nations enjoy comparable levels of technical sophistication and the potential for sharing advanced, costly facilities. Since opportunities for interaction with these countries are readily available, the greatest latitude should be given to individual cooperation and exchanges independent of formal bilateral programs. However, the NSF should continue to participate in selected intergovernmental agreements that serve identifiable useful functions.

Developing countries, many of which have a corps of highly qualified scientists, also offer significant opportunities for scientific cooperation, including unique possibilities for access to scientifically important territories and environments. Moreover, international scientific cooperation may offer economic, diplomatic and other policy benefits going beyond the immediate needs and interests of science per se. With many of these countries, bilateral agreements, including the provision for support and maintenance of continuity, are required to ensure the success of collaborative scientific activities. Since direct contact between the involved scientists is essential to ensure the effectiveness of the programs, the U.S. should continue to encourage an emphasis in its bilateral agreements on such scientist-to-scientist cooperation.

There is also evidence of benefit for U.S. science from contacts with scientists from Communist countries. Opportunities for individual scientific cooperation, even in the presence of strained political relationships, keep open channels for communication and can lay foundations for enhanced cooperation should conditions become more propitious in the future. Exchanges with Communist countries should be conducted so that commensurate benefits flow to both sides.

The levels of scientific activity with these three classes of nations will vary in time as scientific opportunities change and in reflection of the evolution of our foreign relations. At any given time, these levels will reflect a balance between needs and opportunities for American science and the goals and requirements of foreign policy and national security.

The Board concludes that because the international dimension is intrinsic to the nature of scientific research and because of the Foundation's role in the support of the Nation's foreign policy, the Director of the Foundation must play a significant role, in collaboration with the Department of State and the Executive Office of the President, in the development and implementation of the international science policy of the United States.

The Board strongly supports the Director in that very important dimension of his responsibilities. So that the Board can take these policy considerations fully into account in its planning, the Board must keep abreast of international initiatives and U.S. foreign policy objectives that should be considered in formulating the Foundation's priorities and budget.

MODALITIES FOR FACILITATING INTERNATIONAL SCIENTIFIC COOPERATION

Agencies such as the NSF, as well as universities and nongovernmental professional scientific organizations, will each have unique and important contributions to make toward the success of cooperative international scientific activities. The Foundation, by virtue of its fundamental and broad-based scientific program, should take the initiative, in cooperation with the Department of State and other agencies as appropriate, to bring together potential international partners to accomplish the necessary planning and implementation for international sharing or collaboration in fundamental science and engineering research.

Under the auspices of the International Council of Scientific Unions, a number of multilateral scientific programs have been successfully carried out, often with the cooperation and assistance of intergovernmental organizations and member governments. The International Geophysical Year program (the 25th anniversary of which is being commemorated now) has offered a useful paradigm for subsequent efforts in the atmospheric, geophysical and ocean regimes. The Foundation should use such multilateral channels when attractive opportunities arise.

The role of the National Academy of Sciences (NAS, NAE, IOM) as a Congressionally chartered, yet private organization, has enabled it to relate to many nongovernmental institutions throughout the United States in cooperating with other countries. This is a source of strength of which the Foundation should take full advantage. The National Academy has an especially significant role to play in facilitating international scientific cooperation, both by virtue of serving as the U.S. representative in connection with various nongovernmental international scientific organizations, and through bonds of cooperation with similar academies in other countries.

INTERNATIONAL SCIENTIFIC COMMUNICATION

Maintenance of a strong technological position is central to our national security and to our economic and commercial vitality. Technology leadership depends on a creative and vigorous science and engineering base which, in turn, benefits greatly from an effective international exchange of scientific and engineering information. Opportunities for exchange of novel ideas and rapid assimilation of new research results provided by contacts and conferences have long been important to the progress of science. These exchanges have served the Nation well in terms of contributing to rapid advances in basic research, innovation, application of research results, and development of state-of-the-art technology.

Foreign students, teachers, and researchers working on American campuses are also an important resource, both for our universities and ultimately for our industry's success in foreign markets. As a result of the advanced state of development of the U.S. scientific enterprise, the U.S. has been particularly efficient in absorbing, understanding, and extending new ideas from all sources, foreign and domestic; and this in itself is becoming an increasingly vital component of the success of U.S. science and its contributions to technology and industrial strength.

Advances in scientific knowledge are usually incremental and interdependent. They are facilitated by knowledge of other scientists' successes and failures, and by the criticism of one's peers -- that is, by open discussion. Openness on the campuses of American colleges and universities is particularly central; for it is there that new research directions are frequently conceived, and there that the next generation of scientists is trained. Restrictions which diminish that openness are likely to have serious costs to science and, ultimately, to national security. Such costs should be carefully considered in all dimensions before implementing any actions that would compromise the traditional open environment that has served us so well in the past.

In those special instances where universities choose to undertake proprietary or classified work, they may have to accept constraints on communication.

CONCLUDING STATEMENT

The nature of science requires that its international dimension be considered an organic aspect of the scientific enterprise. This dimension must be actively provided for in all Foundation programs, from education and fellowships to the various disciplinary efforts in the natural sciences, social sciences, and engineering. Planning for new facilities and the setting of priorities for major scientific investigations and programs should be carried out with the full recognition of the priorities of other countries and in an environment which encourages complementarity or planned supplementation, cost sharing, and coherence of the various efforts of cooperating countries. National Science Foundation organization and management procedures should reflect these principles.

The Board will continue its analysis of the subject of "Science in the International Setting" in connection with the preparation of the Sixteenth Board Report of this same title.

EXPERIMENTAL RESEARCH GRANT ADMINISTRATION

Question: On September 10, 1982, GAO issued a reported entitled, "NSF Experimental Research Grant Administration Promising -- Changes Needed To Assure Accountability". In that report, GAO notes that the flow of paperwork was reduced between universities and NSF as a result of the grant experiment and noted other benefits deriving from the experiment. However, GAO recommended that NSF review each university's approval system to assure that the university has established a system that can act responsibly before NSF makes any delegation of prior approval authority.

What is NSF doing in order to review each University's system for managing grants under its jurisdiction?

Answer: The following measures are being employed to assure that grantees comply with the Organizational Prior Approval System (OPAS) standards required by NSF:

- The Division of Grants and Contracts has requested a one-time certification indicating whether or not the grantee has established an OPAS.
- The Division of Grants and Contracts will systematically review grantee Organizational Prior Approval Systems and OPAS transactions at selected institutions by requesting copies of individual OPAS action documentations and conducting on-site reviews.
- The Division of Grants and Contracts is coordinating its oversight activities with the NSF audit staff and cognizant audit agencies (including participation in Total Business Reviews conducted by the Office of Naval Research) in order to assure that a review of Organizational Prior Approval Systems and grantee performance is included as part of Federal audit activities.
- A Division of Grants and Contracts "hot-line" has been established to answer general questions regarding grantee implementation of Organizational Prior Approval Systems. Specific questions are referred to the responsible Division of Grants and Contracts award branch.

The Foundation is building on existing oversight/liaison mechanisms as much as possible in monitoring institutions' implementation of the expended prior approval delegations. One of the basic oversight mechanisms is Division of Grants and Contracts review of an organization's financial managerial responsibility before NSF makes any award to a "first-time" applicant for NSF funding. Hence, existing NSF grantees are assumed to have adequate management capability for handling the additional delegations, which are simply an expansion of existing authorities already under grantees' control. Therefore, it is not considered necessary or desirable to review again, grantee management systems prior to delegation of the expanded authorities.

Senator Garn—Continued

GAO further notes that applicable NSF regulations should explicitly provide that the authority to approve pre-award costs cannot impost an obligation on the United States before the availability of appropriations.

Question: What have you done to assure that this limitation is clearly understood by Universities?

Answer: This limitation is specifically addressed in Article 3, "Pre-award Costs of the Grant General Conditions (attached to every grant letter) which states in part:

> Pre-award expenditures approved by the OPAS are made at the grantee's risk. Grantee authority to approve pre-award costs does not impose an obligation on the Foundation prior to the availability of appropriations.

POST-PERFORMANCE EVALUATION PROGRESS REPORT

Question: On May 9, 1983, you submitted a progress report on your post-performance evaluation project to the Subcommittee. Could you please provide this letter report for the record at this time?

Answer: A copy of the report is attached.

Dr. Wallace Berger
Subcommittee on HUD-Independent Agencies
Committee on Appropriations
United States Senate
Washington, DC 20510

Dear Dr. Berger:

Enclosed is a report of our progress to date with the post-performance evaluation of the Chemistry programs. Only preliminary conclusions and brief descriptions of the analyses are presented in this report. Final conclusions, detailed analyses and supporting data will be in the final report. The final report should be completed in about six months depending upon how many exceptionally bad or good projects (discussed in the progress report) are identified and need to be investigated. We probably already have the most important findings. We find that the renewal process can provide ratings that are useful for post-performance evaluation, but changes are needed to ensure that such information is provided routinely. Further, the ratings of prior work can be used to provide assurance that the system is working as it should or if not, indicate what changes are needed.

Sincerely yours,

Edward A. Knapp

Edward A. Knapp
Director

Enclosure

A Progress Report on The NSF Post Performance Evaluation Study

In July 1980, the Senate Appropriations Committee directed the National Science Foundation (NSF) "to secure an independent third party to develop a methodology for post performance evaluation of scientific research endeavors." At the request of NSF the National Academy of Sciences (NAS) undertook this task in 1981. The results of this effort were presented in a report "The Quality of Research in Science." Subsequent correspondence with the Senate Appropriations Committee, and in particular with Dr. Berger of the committee staff, led to the formulation of the study which is the subject of this progress report.

The study has two parts. The first part is an analysis of a random sample of renewal proposals from the Chemistry division to confirm the assertion by NAS that adequate post grant peer review already exists in the renewal jackets; or, if not, to describe what is needed for the renewal process to yield adequate peer reviews of completed work. The second part of the study is a post performance evaluation of the short term results[1] of the Chemistry research program.

The gathering of the data for the first part of the study has been completed. As a result, we now have a very clear idea of how much reviewing of the proposer's prior work is, and can be, done as part of the renewal process. We have not completed our analyses of this data, because of the time and effort required to put the data into a form amenable to analysis. Nonetheless, some conclusions are possible and, we think, unlikely to be changed by further analysis.

- Actual ratings of the prior work were obtained from reviewer comments by Dr. K. Hicks, a knowledgeable chemist; they have the following properties:

  (1) they are correlated with bibliometric citations to the prior work;

  (2) they are not overly correlated with the ratings of the renewal proposal; and

  (3) their reliability compares favorably with other ratings.

- One-quarter of the renewal proposal jackets yielded no useable rating of prior work, and the average number of reviewer ratings for cases that yielded ratings was 2 1/2. This is not sufficient for routine use.

- The effort to obtain the ratings of prior work from the reviewers comments was too great. It cannot be done routinely. Moreover, there is too much ambiguity in the process: (1) reviewer comments had to be interpreted; (2) no standards for the review of prior work were set for reviewers; and (3) the body of prior work was ill defined.

- Since reviewers of renewal proposals can and to some extent now do rate the prior work independently of the renewal proposal, minor changes in the renewal proposal rating process would almost certainly yield more and better ratings of the prior work. Moreover, they would be more easily obtained. The changes are: (1) a request for an explicit rating of the prior grant using NSF-stated criteria and (2) insistence on the inclusion by the proposer of a bibliography and progress report for the prior grant in the renewal proposal. On the latter point, last year we added the requirement that publications resulting from the predecessor grant be specifically identified in the bibliography so that this change has already been accomplished.

We have also made progress on the second part of the study, the evaluation of the NSF Chemistry program. Here, in addition to more analysis, we feel the need for more data--viz., bibliometric data on the recently completed Chemistry projects.

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[1] Some evaluation of long term impacts and oversight on the award decision process are already being done--e.g., the recently completed Chemistry Patent Study and the Annual Fairness Study.

- A preliminary conclusion based on a bibliometric analyses of an earlier sample and the prior work ratings of the more recent sample is that the Chemistry Division renews its better projects. The quality of the prior work is higher for awarded renewal proposals than for declined renewal proposals. However, for "achievement-based" renewals the difference is not statistically significant. Since the choice of proposal format is made by the investigator, the importance of this latter finding is not clear.

- The overall quality of completed work in Chemistry in 1982 as determined from ratings of the completed work in the renewal proposals is 4.28 on a scale of 1-5, where 5 is the highest. We would expect the renewal proposal award rating to be higher than 4.28, and it is at 4.43. (The rating for proposals resulting in awards being markedly lower than the rating for prior work might suggest too many awards.)

- Cases in which the rating of completed work is unusually high or low (and there seem to be some) will be studied to determine what light they shed on the selection process. (In carrying out an investigation of these exceptional projects, it would be desirable to obtain bibliometric data for the FY '82 sample, since 27% of the projects in the sample did not have quality ratings. In addition, we could further validate the ratings. The bibliometric data will be difficult to get, because bibliographies in the renewal proposals do not, in most instances, identify the publications yielded by the prior grant. We are investigating the practicability of obtaining the bibliometric data to support the analysis of the exceptional projects.) The analyses of the exceptional projects will be in the final report.

- Ratings of the prior work add an important variable to oversight on the award decision process. We shall statistically examine decision as a function of prior work rating as well as proposal rating. One kind of outlier possibly resulting from this examination is as follows:

  The ratings of the renewal proposal will be compared with the award decision and the highly-rated declinations or lowly-rated awards will be identified. The quality ratings of prior work will be used to explain these deviants. Those still left unexplained by the ratings of the prior work are candidates for further investigation as in the case of the exceptional projects. We have identified a few candidates for such projects. This analysis is in progress and the results will be included in the final report.

In addition to completing the above analyses we shall explore other uses of the reviews of prior work that we think the renewal proposal process can be made to yield.

- Ratings of prior work can add an important dimension to the evaluation of the treatment of young investigators at the time (judged critical in the NAS report) of their first renewal proposal. Young investigators are not proven performers, and the most important part of their track record is likely to be their just completed work, for which we will now have a rating.

- We have some classifications of the completed work other than quality. Potentially the most interesting address the originality of the completed research. We find that originality in the completed work is valued. We hope to compare this originality/rating relationship in the prior work with the same relationship in the proposal. As a general point, this offers another way of comparing proposed and performed research.

The final report will include these analyses.

Question: In that report you note that the renewal process could provide ratings that are useful for post-performance evaluation but "changes are needed to insure that such information is provided routinely." What types of changes are you referring to?

Answer: As discussed in the report, it will be necessary to modify our review procedures for renewal proposals to request that the reviewer provide a specific rating of the quality of the work done under the preceding grant.

Question: You further noted that "the ratings of prior work can be used to provide assurance that the system is working as it should or if not, indicate what changes are needed."

Could you please expand on the types of "system checks" that could be done toward the use of ratings of prior work?

Answer: Ratings of prior work will add an important variable to oversight on the award decision process. The contributions of prior work quality to the award decision for different levels of renewal proposal quality can be assessed. Further variables like investigator age, institution or originality can be investigated to explain (or not) award decisions that are ill predicted by renewal proposal and prior work quality. In addition, exceptional cases where the completed work was unusually good or bad can be studied to determine what light they shed on the selection process.

The choice of which aspects to examine in detail will depend upon which directions appear fruitful on preliminary inspection of the data. Disagreements between pre-and post-performance ratings may identify possible improvements in our decision process. Judgements by program staff and advisory committees may indicate that more attention needs to be given to proposals which would produce very important knowledge if successful but may not succeed. The treatment of young investigators can be compared to the quality of their first supported research. Occasional bibliometric studies are a check on the quality ratings by reviewers.

Question: You further note that the ratings of prior work can "add an important dimension to the evaluation of the treatment of young investigators at the time of their first renewal proposal."

What plans do you have to collect such ratings on young investigators in the future?

Answer: As noted above, it will be necessary to obtain specific quality ratings of the completed work. This will be done for both young and established investigators. Correlations between quality and renewal awards can then be made.

Question: You also note in your letter that one other area of interest is the originality of the completed research. You state that the Foundation hopes to compare the originality/rating relationship in the prior work with the same relationship in the proposal.

What would be the implications if no such correlation was found?

Answer: Our preliminary attempts to rate originality can have a number of outcomes. The one we mentioned and which prompted your question posited different originality/rating correlations for completed work and proposals. This, in time, might lead to reviewer instruction changes, since it might be evidence of over- and under-valuation of originality in proposals. If originality is simply unrelated to quality of either completed work or proposals, the meaning would not be clear.

Both new directions of exploration and follow-up work are needed for the advancement of knowledge. If the study indicates that the balance between the two is noticeably different from that which we expect, we will modify our guidance to the program staff on selection of projects.

Question: I note that your preliminary findings indicate that one quarter of the renewal proposals jackets yielded no useable ratings of prior work, and furthermore, the average number of reviewer ratings was two and one-half. You conclude, "this is not sufficient for routine use."

What effort does the Foundation intend to undertake in order to provide a more systematic and complete post-performance rating appraisal on the proposal jackets?

Answer: As noted above, it will be necessary to request reviewers to provide a specific rating of the quality of the preceding work.

Question: On a more fundamental level, one of your tentative conclusions indicates that actual ratings of the prior work are " not overly correlated with the ratings of the renewal proposal."

What does this imply to you--is this a result of methodological or data limitations?

Or do you believe that it represents an underlying lack of relationship?

Answer: The prior work ratings are correlated with the renewal ratings. We were encouraged that the correlation was not so high as to suggest that the reviewers of the renewal proposal simply made their view of the proposal their view of the prior work. That the correlation is high but not too high is as it should be.

We are discovering limitations in the prior work rating data. We trust that in the future they will will be eliminated or greatly ameliorated by the very considerable improvements we are suggesting for the collection of prior work ratings.

In addition, the rating of the renewal proposal is based on the significance and anticipated quality of the work proposed. The former, and to a lesser extent the latter, can differ from that of the preceding work. For example, the earlier may have been very well done and important, but a continuation of the same type of work may not be as important as some other effort.

Question: What is the schedule and milestones for the remainder of the study?

Answer: All data for the bibliometric studies will be abstracted by the end of April. Analyses of the data other than citations to papers will be completed by mid-June. Citation data will be available by mid-July.

Analyses will be completed by the end of August. The report should be completed by the end of September. Our recommendations about getting better ratings from the renewal process will also be firm by October, although the implementation will take more time.

INSTRUMENTATION

Your budget justification indicates that research instrumentation for NSF as a whole will increase by 100 percent between FY 1982 and FY 1984 and by 60.5 percent between FY 1983 and FY 1984. A closer look at the figures contained in your budget indicate that in the field of engineering you anticipate a 109.2 percent increase in instrumentation funding between FY 1983 and FY 1984.

As you will recall, the FY 1982 Senate Appropriations Committee Report contains specific language relative to the instrumentation problem and I quote, "The Committee recognizes the need for an instrumentation replacement program on a national scale. Information presented to the Committee to date, however, indicates that the Foundation has not adequately identified the roles of other government agencies and the private sector in addressing the instrumentation needs of universities. Additionally, the Committee is concerned about the priority process that will eventually be used for the selection of grantees. Because these issues remain unresolved, the Committee has not provided any funds for the initiation of this program during FY 1982. However, the Committee is convinced that a real need exists and, therefore, directs the Foundation to continue developing a plan for an instrumentation program using such funds as may be necessary."

Question: What is the status of this plan and how have you satisfied the Committee's concern about the role of other Federal agencies and the process for selecting grantees?

Answer: In FY 1984, the Foundation adopted a philosophy different from that which governed earlier proposed instrumentation initiatives. We believe now that a central program is not the most effective method of providing NSF support to upgrade university research instrumentation. Instead, we believe instrumentation funding decisions should be made within the priority-setting process specific to each scientific disicipline. These processes include advisory committees, peer reviewers, and program officers from the NSF divisions and agencies. The plan consists of each division's special approach to the needs and priorities of its disciplines.

With the support of the President's Science Advisor, the Foundation has organized and chaired the Interagency Working Group on University Research Instrumentation with representation from the Department of Defense, the Department of Health and Human Services, the Department of Energy, the Department of Agriculture, and National Aeronautics and Space Administration.

These agencies and NSF provide more than 95 percent of federal support of university research. With NSF, they are acquiring further data on the state of university instrumentation, taking new initiatives within their research budgets to place greater emphasis on instrumentation, focusing small business funds on research instrumentation innovators and making federal laboratories more readily available to university researchers.

The process of selecting recipients of instrumentation grants is identical to that applied to the selection of other research grants.

Question: Your budget justification indicates that one of the areas where the instrumentation money will be used will be to provide support for the purchase of mini-computers by individual investigators. On what basis was it determined that the purchase of mini-computers represented a high priority use of these funds?

Answer: For certain fields of science mini-computers are vital. Priority decisions within each discipline and by NSF program officers, advisory committees and the peer review process produce an overall judgement as to the value an investment in mini-computers would bring to scientific progress in them.

Question: Has the Foundation determined what types of equipment, such as mini-computers, could be more appropriately supplied by industry or the universities, and what kind of equipment would most likely not be available to researchers without a Federal investment?

Answer: The Foundation does not make decisions appropriately left to the private sector. However, studies show that, historically, two-thirds of the current university instrumentation inventory was purchased with federal funds. Escalating costs and increased sophistication of equipment suggest that the percentage will be greater in the future.

Question: What types of studies have you conducted that would help you make these resource allocation decisions and help you set priorities for your instrumentation program?

Answer: Studies have been made by various discipline-oriented groups to help guide instrumentation decisions within the respective disciplines. Examples include studies by the American Chemical Society for chemistry, the American Geophysical Union for the earth sciences and the American Electronics Association for computer-related engineering disciplines.

Question: Your budget justification indicates that as part of your instrumentation initiative the universities have accepted responsibility for improving their management of instrumentation and are about to embark on a major educational effort to encourage new financing arrangements, equipment sharing, more responsive university regulatory policies and adequate maintenance. Do you plan to enter into agreements outlining the universities' responsibilities for the procurement and maintenance of instrumentation before providing new funding for instrumentation?

Answer: Each proposal will address procurement and maintenance, and these will be reviewed as integral parts of each proposal. Specifics will vary from proposal to proposal, discipline to discipline and university to university. University officials have tried many methods for financing equipment, and program officers will discuss relevant methods for such financing as they may be applied to successful proposals. The resulting plan could be regarded as a specific agreement to carry out whatever arrangements result from these discussions around proposals.

MICHIGAN STATE UNIVERSITY HEAVY-ION ACCELERATOR

Question: Last year the outyear costs associated with assuming the responsibility from the Department of Energy of the Michigan State University heavy-ion accelerator were requested. At that time, it was estimated that Phase II construction expenditures in FY 1984 would be $5.5M and Phase I operation and research costs would be $3.2M per year in FY 1982 dollars.

Answer: In the NSF FY 1984 Budget Request to Congress it is estimated that $6.0M is required to continue Phase II construction of the heavy-ion, superconducting cyclotron at Michigan State University.

It is also estimated that operation and research with the Phase I heavy-ion facility at Michigan State University requires $3.9M.

EXPERIMENTAL RESEARCH PROGRAMS IN CHEMISTRY

Your FY 1984 budget justification proposes an increase of $8.1 million or 15.1% for Chemistry Projects Support. Your budget justification says these funds will be used to "Revitalize and Accelerate Promising Experimental Research Programs."

Question: Could you please explain how these "Promising Experimental Research Programs" will be identified?

Answer: The Chemistry Division has three main sources for identifying promising research areas:

- The Report on Future Trends in Chemistry, which is updated annually by the National Science Foundation's Advisory Committee for Chemistry.
- Reports from workshops that deal with specific areas of chemical research.
- Information that is extracted from the peer review of over a thousand investigator- initiated proposals each year.

Historically, these sources have provided the Chemistry Division staff an excellent forecast of research areas with the greatest potential for significant new research results and, importantly, an early indication of the research needs (e.g., instrumentation, materials and supplies, personnel) of these expanding research areas.

Question: What types of activities would you intend to fund in order to revitalize and accelerate these research programs?

Answer: The specific research areas that are expected to expand in FY 1984 include:

- Metal cluster chemistry;

- Direct synthesis of cage-like molecules and semi-synthetic enzymes;
- Chemically modified surfaces;
- Liquid phase chemistry; and
- Laser chemistry.

In each of these areas, recent advances in chemical theory and instrumentation are providing chemists with new insights and measurement capability that permit unambiguous interpretation of chemical phenomena. Advances in these research areas have great potential for being translated into products and services that support our Nation's economy.

In addition to modern chemical instrumentation (e.g., lasers, high resolution nuclear magnetic spectrometers, mass spectrometers, and computers), research programs in these expanding research areas require highly trained personnel (e.g., graduate students, and post doctoral fellows), significant levels of support for materials and supplies (e.g., chemicals), operating costs for sophisticated research instrumentation, and replacement of worn-out or obsolete research equipment. In recent years, U.S. scientists working in expanding research areas have been handicapped significantly due to underfunding of the infrastructure needed to pursue effectively experimental research. Increasingly, we are finding that chemists in Germany, France, and Japan have better equipped and more productive research programs.

Question: Could you please provide several examples of actual, ongoing NSF projects where additional funds could be used to accelerate the program?

Answer: The Chemistry Division, in seeking to maintain a healthy balance of research support across the discipline, has had to deal with the tension between increasing individual grant sizes on the one hand and increasing the total number of awards on the other. Thus, although the present program of grants has been optimized to achieve the strongest total U.S. research effort, the result is that all of the more than 800 individual research projects funded by the NSF Chemistry Division are underfunded relative to the level needed to achieve the most rapid rate of progress. In addition, nearly 100 highly rated chemistry proposals must be declined each year because of the intense competition for the available research funds.

The five examples we have selected illustrate research in areas where we anticipated growth in the next few years.

Metal Cluster Chemistry: Industrial catalysts are prepared by dispersing a metal salt or a combination of metal salts and certain activators on a suitable support such as a simple metal oxide or perhaps a more complicated support such as zeolite. The metal atoms occur in aggregates or clusters ranging in size from small clusters with only a few atoms to truly massive particles with thousands of metal atoms. The activity and reactivity of catalyst depends directly upon such factors as chemical composition, degree of dispersion or particle size, and support interactions. Each of these factors has a direct analogy in the chemistry of cluster compounds and metal-metal bonded species.

Little is known about the mechanisms of actual chemical processes upon a hetrogeneous calalyst, because normal chemical techniques cannot be applied to heterogeneous systems. Basic facts such as geometry of the catalytic site and the nature of intermediate species are not known. Detailed studies of cluster compounds and related species are possible and recent work has led to an increased understanding of reactions such as the reduction of CO by H_2. Once the reactions of cluster compounds are well understood the knowledge gained should lead to direct applications in the rational synthesis of catalytic systems for industrial processing.

Research in metal clusters is manpower intensive, preferably done by large groups with synthetic, structural and theoretical studies being done in consort. Several metal cluster groups around the country are generally understaffed and poorly equipped for the intricacies of research in this area. A typical example is the case of a very promising young investigator, Dr. Joseph W. Lauher, State University of New York at Stony Brook, who is working with bimetallic cluster systems which form an important class of catalysts having the advantage of continuous variability in their metallic properties.

Direct Synthesis of Cage-Like Molecules and Semi-Synthetic Enzymes: Enzymes are nature's workhorses by which biological systems carry out and control the details of life processes. Recently chemists have been successful in the design and synthesis of new molecules that possess enzyme-like catalytic properties. This is a very significant development. It has opened the possibility of systematically producing "chemical mutations" of existing catalytically active proteins to create new catalytic entities, which may become important tools for producing synthetic organic molecules. This line of research is currently being pursued by NSF grantee, Dr. E. T. Kaiser at Rockefeller University.

Another direction of expanding activity involves the construction by hybrid peptides and proteins with properties that are not realizable with the naturally occurring amino acids. Dr. Daniel S. Kemp of MIT is currently synthesizing analogs of the natural amino acids. The objective of this work is to better understand the structural features that control the shape and folding of the proteins. The synthetic models are designed to provide significant tests of current theories of protein folding and ultimately to improve our understanding of the biological activity of enzymes.

Chemically Modified Surfaces: Chemists have recently developed methods for synthetically attaching monolayers of electrochemically reactive molecules to electrode surfaces. These surface-modified electrodes have attracted considerable scientific interest because of the great potential they offer in developing new chemical sensors and discovering new electrocatalytic processes that are more efficient and more selective than simple electrode chemical systems. One of the current world leaders in this important research area is NSF grantee Dr. Royce W. Murray at the University of North Carolina.

Liquid Phase Chemistry: The majority of chemical reactions are carried out in solution. However, the way in which the solvent influences the rate and course of a chemical reaction is poorly understood. One reason for this lack of understanding is the short time scale on which molecules collide and exchange energy in liquids. Experimental techniques are now available which enable direct measurement of some of the primary processes involved in chemical reactions, such as molecular motion, energy exchange between solvent and solute, and solvent response to the rapidly changing electronic nature of a solute molecule during the course of a reaction. These measurements involve the use of lasers which produce pulses as short as 10^{-13} seconds (100 femtoseconds). Dr. Graham R. Fleming of the University of Chicago is using laser techniques to study photochemical isomerization (where the molecular configuration changes shape after optical excitation of the solute molecule) and photodissociation (where the molecule fragments into two components after optical excitation). The combination of high pressure techniques with the ultra-fast laser spectroscopy makes possible unambiguous studies of the influence of various solvent properties, such as viscosity, polarity and dielectric relaxation time.

Laser Chemistry: The rapidly expanding arsenal of lasers is permitting chemists to analyze molecular structure and chemical reactivity in unprecented detail. From this has emerged an entirely new field with far-reaching impact: laser-driven and laser-monitored chemistry. One of many promising programs in this rapidly developing area is that of Dr. Kevin Peters, a young grantee at Harvard University. Dr. Peters is currently being supported by the Chemistry Division to investigate two of the most basic chemical processes (i.e., proton and electron transfer between molecules) using picosecond laser techniques. These fast laser methods are essential for monitoring what happens after an electron or proton is transferred. In this program Dr. Peters has developed a photoacoustic detection method that has enhanced the sensitivity of picosecond laser probe methods by a factor of 1000.

COMPUTER SYSTEMS

Question: On Page NSF-34 of your budget justification, you describe some recent work involving computer systems known as "Expert Systems". Typically these systems follow problem-solving procedures used by human experts to assist non-experts in solving complex problems in specific areas.

To what extent would such "Expert Systems" be of value in either teacher training or student training as part of your science and engineering education program?

Answer: There are two general approaches to the development of "expert systems". In the first, expert information is imbedded into a computer knowledge base and is accessed by professionals to aid in problem-solving in such areas as medicine, mass spectrometry, and data analysis in protein crystallography. This is the type of research described on page NSF-34. The other variety constructs computer models of the problem-solving methodology used by experts and uses them to assist novice problem solvers with problem representation, decomposition, and solution.

Through research supported in NSF's former Research in Science Education program on cognitive processes and the structure of knowledge in science and mathematics, work is progressing on developing computer-based expert-novice models of the second type mentioned. For example, Jill Larkin and Herbert Simon at Carnegie-Mellon University have found that novice physics students tend to approach problem solving quite differently from experts — they try to use straight-forward numerical solving rather than engaging in qualitative thought (as experts do) about the problem before attempting to solve it numerically. Gordon Novak at the University of Texas at Austin has found that this numerical approach of novices is complicated by their inability to decompose the problem into more easily handled subparts.

These findings, and others resulting from NSF-supported projects, indicate that the educational task can be viewed as moving students from novice problem-solvers toward that of expert problem solvers rather than simply teaching physical principles and information.

Question: Does NSF intend to review the potential of such systems for science education?

Answer: The projects mentioned in the foregoing material are continuing and their results are being monitored for their potential for understanding the learning process and contributing to the improvement of science and mathematics education. NSF efforts have involved collaboration between Science and Engineering Education staff and colleagues in Information Science and Technology and Cognitive Science in BBS as well as interactions with staff at the National Institute of Education. NSF has been a leader in the study of expert systems as they aid in understanding the learning of science and mathematics and further research is planned in this area in the future.

NATIONAL MATH RESEARCH INSTITUTES

Question: On October 18, 1982, you announced the formation of two national institutes to stimulate research in the mathematical sciences.

Could you please describe the current status of the Berkeley and Minneapolis institutes in terms of funding, mathematical scientists appointed, and number of graduate students?

Does the Foundation intend to initiate any additional mathematics institutes during FY 1984?

Answer: Each of the Institutes is currently nearing the end of its first academic year of operation and is proceeding according to plan.

The Mathematical Sciences Research Institute (MSRI), in Berkeley, California, devoted its first year's scientific program to two topics: nonlinear partial differential equations and statistics. Both these programs have been extremely well-received by the scientific community. The planning for next year's operation is proceeding well, with ergodic theory and infinite-dimensional Lie algebras the topics selected for special focus. The funding level for the first year was about $1,600,000, with approximately the same level of effort in the second year. This included funding for about 25 Full-Time Equivalent (FTE) scientists positions, with about twelve individuals who were recent recipients of the Ph.D.

The program at the Institute for Mathematics and its Applications (IMA) at the University of Minnesota focused its first year on statistical and continuum approaches to phase transition. Funded at about half the level of the Berkeley institute, the IMA will devote its second year to the general area of mathematical economics, and more particularly, Mathematical Models for the Economics of Decentralized Resource Allocation. The funding level for the first year was about $800,000. This permitted the participation of eight FTE senior scientists and about seven postdoctorals.

There was no provision for graduate student support in the budget of either institute.

There are no plans to initiate additional institutes during FY 1984.

FY 1982 CARRYOVER IN MATHEMATICAL AND PHYSICAL SCIENCES

Question: On Page MPS-4 of your budget justification, you note that your current plan for Mathematical and Physical Sciences includes a $700,000 carryover from the FY 82 appropriations. You attribute this carryover to "late passage of the FY 83 appropriations act".

As you know, the FY 83 HUD-Independent Agencies Appropriations Act was signed by the President on September 30, 1982, which made it the only regular FY 83 appropriations act to be signed before the beginning of FY 83. In fact, the FY 83 HUD bill was the only appropriations bill to be signed before the beginning of the Fiscal Year during the last three years. Therefore, I am a little bit sensitive to the suggestion that this $700,000 carryover was due to the fact that this Subcommittee did not do its homework.

Answer: The FY 1983 HUD-Independent Agencies Appropriations Act was signed on the last day of FY 1982. NSF delayed final obligation of approved FY 1982 awards, including those in Mathematical Sciences, in order to provide a contingency fund to meet emergency requirements in the event the appropriation had not been signed by September 30. These approved awards were immediately obligated in October when it became evident FY 1983 funding was available.

MATHEMATICAL SCIENCES SPECIAL PROJECTS PROGRAM

On page MPS-I-8 of your budget justification, you state that "the New Obligational Authority (NOA) for the Special Projects program element has increased by $0.4 million above the FY 1983 budget request of $6.6 million to provide and enhance support of young investigators through the mathematical sciences postdoctoral research fellowship program". However, the table on NSF-42 of your budget justification shows an increase in this special projects program of $1,106,437 not $400,000.

Question: Can you please explain this apparent discrepancy?

Answer: The table on page NSF-42 is not an NOA table and thus includes carryover funds from FY 1982 (and other adjustments). Included in the $7,706,437 for Special Projects in Mathematical Sciences is $683,437 in FY 1982 carryover funds. When the FY 1982 carryover is subtracted from the FY 1983 Current plan for Special Projects, the result is 7,023,000 in New Obligational Authority. This is $0.4 million above the FY 1983 request of $6.6 million.

ACCESS TO LARGE-SCALE SCIENTIFIC COMPUTING FACILITIES

Question: Your budget justification indicates that a significant increase in support will be provided for your mathematics research activity in order to provide increased access to large-scale scientific computing facilities.

Could you please explain in more detail how NSF will support this increased access?

How much money will be devoted to this activity during FY 1984 and how does it compare to the FY 1983 levels?

Answer: The FY 1984 Budget for the Mathematical Sciences Subactivity proposes an increase of $1.3 million in support of activities in computational mathematics and for access to large-scale scientific computing facilities.

Of this sum, $0.5 million is planned for the support of projects, graduate students, and postdoctorals in computational mathematics research distributed in all the mathematical sciences programs, with particular emphasis in the Applied Mathematics, Statistics and Probability, and Algebra and Number Theory programs. Computational mathematics is a research area of high scientific opportunity, with rapid developments, significant applicability, and a shortage of appropriately trained scientific personnel. In FY 1983 approximately $2.0 million was devoted to the support of research in this area, including $0.7 million for the purchase of computational equipment.

Approximately $0.8 million of the proposed increase in the Mathematical Sciences Subactivity is planned for the provision of access to computational facilities, including supercomputers, array processors, and general and special purpose scientific computers. This research instrumentation effort is part of a larger one, encompassing all of the Divisions within the Mathematical and Physical Sciences Directorate, and totaling $5.0 million. The precise method of allocation of these funds between the purchase of computer time, networking costs, and computational equipment and support staff is, at this time, under consideration.

SUPPORT FOR UNIVERSITY LABORATORIES AND NATIONAL USER FACILITIES

Question: Could you provide for the record a more detailed description of the types of equipment, operations, and research support that will be provided in each of the laboratories and national user facilities and indicate any new initiatives.

Answer: The program at each laboratory or facility can be considered to consist of three interrelated components: research equipment and instrumentation; operation of the laboratory or facility in terms of technical support, operation of accelerators or other major experimental apparatus, and provision of services to users; and actual conduct of the research programs within the laboratory or facility by faculty, postdoctoral, and graduate student investigators. The balance among these three components varies in accordance with the objectives of the laboratory or facility and the requirements of the research. However, the ultimate purpose of all laboratories and facilities is to make possible the conduct of modern forefront research that cannot effectively be carried out through individual or small group projects.

The FY 1984 budget levels requested for nearly all of the laboratories and facilities represent somewhat strengthened support for continuing activities, with emphasis where appropriate on more adequate provision of research instrumentation. Two items that may be viewed as initiatives are $1.0 million for upgrading of the Van de Graaff accelerator at the University of Rochester and $3.4 million for establishing 4-5 additional experimental computer research facilities, in accordance with long range plans. Additional detail with respect to each individual or group of university laboratory and each national user facility is provided below.

University Laboratories -- Support for instrumentation, operations, and research at university laboratories in Computer Research, Physics, and Materials Research is increased by $11.2 million, or 25.3 percent, to a total of $55.4 million.

- Support for the experimental computer research facilities is increased by $3.4 million, or 35.3 percent, to a total of $13.0 million. This amount provides support for the addition of 4-5 facilities for a total of 18-19 experimental computer research facilities.

- Support for the electron accelerator at Illinois is increased by $0.6 million, or 20.1 percent, to a total of $3.5 million, to permit enhanced research and development on a higher energy electron microtron accelerator.

- Support of the low energy nuclear laboratories is increased by $2.9 million, or 35.4 percent, to a total of $11.1 million, including $1.5 million for upgrading computers and other instrumentation. Within this total, construction of a post accelerator at Florida State University is continued at a cost of $0.9 million and upgrading of the University of Rochester Van de Graaff is initiated at a level of $1.0 million.

- Support for the Materials Research Laboratories program is increased by $4.3 million, or 18.3 percent, to a total of $27.8 million to permit strengthening of major instrumentation and the central experimental facilities. One or two new MRLs may be established.

National User Facilities -- Support for national user facilities in all subactivities except Chemistry is increased by $5.7 million, or 14.0 percent, to a total of $45.8 million.

- The coherent mode of support in mathematics is increased by $0.5 million, to a total of $5.2 million. Included in these projects are the Mathematical Sciences Research Institute at Berkeley, and the Institute for Mathematics and its Applications at the University of Minnesota as well as increased support of postdoctorals and visitors at the Institute for Advanced Studies at Princeton, the Mathematics Research Center at the University of Wisconsin, and the Courant Institute of Mathematical Sciences at New York University.

- Funding of the Cornell Electron Storage Ring (CESR) is increased by $2.4 million, or 24.7 percent, to a total of $12.1 million. This increase emphasizes detector and luminosity improvements and research and development on RF superconducting cavities and other accelerator technology.
- Support for the Indiana University Cyclotron Facility (IUCF) is increased by $1.5 million, or 21.4 percent, to a total of $8.5 million. This increase provides for accelerated construction of the "cooler" ring (for storage, processing, and energy compression of light ion beams from the cyclotron) and enhanced support for users and instrumentation to exploit this new physics capability.
- Support for the Michigan State University Phase heavy-ion accelerator system is increased by $0.5 million, or 14.7 percent, to a total of $3.9 million for operations, research, instrumentation, and for new users to make effective utilization of this forefront heavy-ion facility. The construction of the Phase II cyclotron is continued at a level of $6.0 million.
- The support for the Institute for Theoretical Physics at Santa Barbara, California, is increased by $0.2 million to a total of $1.7 million. Support is provided under both the physics and the materials research subactivities.
- Support for the synchrotron radiation facilities at the University of Wisconsin and Cornell is increased by $0.35 million, or 15.6 percent, to $2.6 million to permit further instrument improvement and exploitation.
- Operation of the National Magnet Laboratory at the Massachusetts Institute of Technology is increased by $0.45 million, or 9.7 percent, to a total of $5.1 million to emphasize magnet development and in-house research related to high magnetic fields.

Question: On what basis did NSF decide to increase university laboratory support by 25.3 percent over the FY 1983 level?

Answer: Requirements for the support of individual and groups of university laboratories were considered in comparison with the requirements of other modes of research support within program elements and subactivities, as well as across the total MPS activity, and relative priorities were established on the basis of scientific merit and balance. Critical instrumentation and equipment needs received particular attention during this process. It should be noted that when the increases in support required to upgrade the University of Rochester nuclear physics accelerator and to initiate 4-5 additional computer research facilities are subtracted from the total support for university laboratories, the increase for continuing activities becomes $6.4 million, or 14.5 percent.

Question: To what extent do the laboratories and facilities being supported with these increases represent the "premier institutions" for research in the specified areas in this country?

Answer: There is every confidence that the laboratories and facilities supported by the Foundation represent the very best institutions for research in specified areas since both continuing and new activities are evaluated by intensive peer review on the basis of scientific merit. In this context, it should be noted that other Federal agencies such as the DOE and DOD also support laboratories and facilities of high quality in areas relevant to their respective missions.

MPS SPECIAL EQUIPMENT PROGRAM

Question: In describing your Mathematical and Physical Sciences Directorate, you request a total of $20.3 million to support a "Special Equipment Program." This represents a $7.7 million or 61.1% increase over the FY 1983 level. What specific type of equipment will be procured under this program?

Answer: As stated in the FY 1984 Budget Request, Mathematics, Computer Research, Chemistry, and Materials Research provide specific support for research instrumentation and equipment intermediate in cost between and in addition to that normally included in research awards, and that available at major university laboratories and national user facilities. This instrumentation is generally for group or departmental use and represents a very effective way of sharing experimental capabilities. Computer Research, Chemistry, and Materials Research have formal program elements for this purpose, while Mathematics provides such instrumentation through the Special Projects program element.

The types of equipment acquired under these programs vary according to discipline. Examples for mathematics and computer research are mini- computers, array processors, and graphics displays. Typical items in chemistry are nuclear magnetic resource spectrometers, mass spectrographs, and mini-computers, while examples in materials research include electron microscopes, laser systems, and surface analysis equipment.

Question: What will the expected cost of each of these pieces be?

Answer: The cost of these pieces of equipment normally ranges from $30K to $300K.

Question: Will there be a requirement for local or industry matching in this program?

Answer: There is no requirement for industrial matching funds, although vendors frequently offer substantial discounts. Substantial matching funds are often provided from university resources.

Question: How will these funds be distributed -- that is, what will the grant selection procedure be?

Answer: The award selection procedure is based on peer review, as with any other NSF award, and proposals are evaluated in terms of the need for the equipment, the abilities of the principal investigators to utilize it, the scientific merit of the research to be conducted, and the broad and effective usage of the equipment.

Question: Will this program be conducted separate from the regular grants process as an equipment program or will the funds be disbursed as part of a regular NSF research grant?

Answer: These programs are conducted within the overall scope and context of the research programs of each MPS subactivity, although the awards are normally for equipment only. As indicated above, these awards are in addition to instrumentation normally included in research project grants or available at major university laboratories or user facilities supported by NSF.

INSTRUMENTATION IN AAEO SCIENCES AT SMALL COLLEGES

Question: During FY 1984, you expect to provide additional funding for research and its associated instrumentation for scientists at small colleges working in the area of astronomical, atmospheric, earth and ocean sciences.

What specific payoff does the Foundation see in earmarking funds for scientists at small colleges in terms of advancing the scientific capability of the nation?

Answer: Additional emphasis on small college faculty research is not limited to the AAEO sciences, but exists in all of the Foundation's research programs. In the AAEO sciences, however, special opportunities for college faculty research are available through national astronomy observatories, the National Center for Atmospheric Research, oceanographic facilities, and polar programs.

Small colleges are an important source of the best graduate students who eventually pursue careers in science. Research by professors at these colleges contributes to the education of these students in a significant way. The additional research support for small college faculty in FY 1984 can extend the research and education contributions already being made by researchers and teachers in the AAEO sciences.

ASTRONOMY INSTRUMENTATION

Question: Your budget justification states that, "The Astronomy subactivity plans to support new, smaller class, submillimeter and optical telescopes in the $1-$2 million range at universities or at one of the national astronomical centers." Does the Foundation intend to provide funding for the purchase and installation of small size telescopes?

Answer: The Astronomy subactivity expects to support the purchase and installation of new optical/infrared telescopes in the 2-5 meter diameter class. Such telescopes were strongly recommended by the National Academy of Sciences' Astronomy Survey Committee as a moderate new program for ground-based astronomy. The Foundation anticipates proposals for such telescopes from a number of institutions. With recent advances in technology and, in some cases, with cost sharing by the proposing institutions, the cost of such telescopes may be in the $1-$2M range. At the present time, the Foundation is providing 50% (approximately $900,000 over 4 years) of the costs of construction and installation of a 2.4 meter (95") optical telescope at the McGraw-Hill Observatory (operated by the University of Michigan, Dartmouth College, and the Massachusetts Institute of Technology). The remaining 50% is being provided by the above universities. In the recent past, NSF provided partial support for construction of the 90" infrared telescope at the University of Wyoming (the remainder being provided by the State of Wyoming).

The Astronomy Survey Committee also gave highest priority among its recommended small, new programs to an antenna approximately 10 meters in diameter for submillimeter-wave observations at a high, dry site. Review of a proposal for such a telesope is currently underway.

Question: How would you justify the purchase of such telescopes from the scientific standpoint--what additional scientific knowledge is likely to be provided through the use of these smaller class instruments?

Answer: Optical/infrared telescopes in the 2-5 meter diameter class have made important contributions to a number of key areas, such as: evolution of galaxies; gravitational lenses; black holes; the discovery of quasars in clusters of galaxies; optical confirmation of the existence of pulsars; the discovery of binary-star system (SS 433) emitting huge streams of matter at one-fourth the speed of light. In addition, telescopes in this class provide follow-on observations and identifications of objects discovered in other wavelength regions. Such telescopes are essential for timely observations of transient phenomena, long-term survey and surveillance programs, and the development of astronomical instrumentation under realistic observing conditions. In particular, long-term projects involving detailed studies of variability in stars and galaxies are well-suited to these instruments.

A 10 meter submillimeter-wave telescope would be used to observe a substantial portion of the almost completely unexplored submillimeter-wavelength spectral band. Such an instrument would make it possible to obtain a detailed examination of the physical structure of molecular clouds--especially the hot, dynamically active clouds where stars are formed. It would also be used to study external galaxies and the envelopes of evolved stars displaying mass loss.

ACTIVITIES IN CRUSTAL RESEARCH

Question: Page NSF-17 of your budget justification states that major upgrading of instrumentation and a "Major research thrust on the evolution and structure of the continental crust" will be permitted through additional increases in the Earth Sciences Programs. The budget justification goes on to say that "increased support for ocean sciences research on crustal studies, particularly work related to the continental thrusts in the earth sciences sub-activity" will be available in FY 1984.

Could you please provide a description of these research thrusts on the crust?

Senator Garn—Continued

Answer: NSF's earth and ocean sciences programs seek to answer questions such as:

- What is the driving force for plate motions?
- How deep are the continental roots?
- What is the chemical and mineral composition of different parts of the crust?
- What are the processes occurring at oceanic ridge-crests, including the hydrothermal systems recently discovered there?
- What are the processes occurring at active continental margins (e.g. California)?
- What are the processes occurring at passive continental margins (e.g. the east coast of the U.S.)?
- What processes shaped the present continental crust of North America?
- How are continents assembled? What causes them to break apart?
- What influence does past geologic evolution have on present-day earthquakes, or on the location of mineral and energy deposits?

The earth's crust is made up of two dramatically contrasting portions: the geologically young, chiefly basaltic, oceanic crust; and the ancient, complexly deformed, chiefly granitic, continental crust. The transition regions where these crustal types meet are especially interesting from both a scientific and practical point of view. The continental crust and the mantle beneath it are studied chiefly by land-based methods in the earth sciences sub-activity; the oceanic crust and its associated mantle are studied chiefly by shipboard techniques in the ocean sciences sub-activity. The critical continental margins require coordinated research of both kinds.

The plate tectonic theory now, for the first time, provides a common theoretical framework for both land-based and ocean-based earth scientists in their attempts to understand the earth's structure and evolution. At the same time, some powerful new tools have been developed that lead us to anticipate rapid and exciting progress in these fields. Such tools include:

- multi-channel seismic profiling, both on land and at sea.
- linked networks of digital wide-band seismographs.
- highly precise geodetic techniques.
- satellite observations of the earth's surface at many wavelengths, and satellite sensing of the earth's gravity and magnetic fields.
- sensitive analytical techniques for geochemical and isotopic studies.
- research submersibles, deep-towed instruments, and multi-beam bathy-metric systems.
- direct sampling by drilling of both the continental and oceanic crust.
- paleomagnetic methods that permit past motions of crustal blocks to be unraveled.

The requested budget provides for new and upgraded instrumentation for earth and ocean scientists and for a balanced program of research in these fields.

ASTRONOMY PRIORITIES

Question: Your budget justification notes that the National Academy of Sciences' Astronomy Survey Committee reviewed the field of astronomy and recommended a variety of scientific programs for the coming decade. Evidently several high-priority new programs were identified in that review, including the Very Long Baseline Array (VLBA), the New Technology Telescope (NTT), and a submillimeter-wave radio facility.

Could you please describe each of these new projects in terms of their scientific utility and expected costs?

Answer: VLBA - An array of ten 25-meter radio antennas located throughout the United States, operated as a single instrument. It will extend capabilities to detect and map astronomical objects at radio frequencies by large factors: an order of magnitude improvement in resolution at the shortest wavelengths and increased sensitivity and dynamic range at other wavelengths. Many of the most exciting, violent, and rapidly evolving astrophysical objects are extremely compact and far below the resolving power of conventional optical and radio telescopes. The form of an accretion disk around a 10^9 solar mass black hole in a galactic nucleus, the structural changes in extremely energetic compact quasars, and the evolution of "superluminal" sources all are questions which await new capabilities in very long baseline interferometry. The nuclear structure of our Galaxy, the properties of the interstellar medium, and the maser emission from the dust clouds surrounding newly formed stars can be studied. Radio parallax methods will be able to yield distance determinations throughout the Galaxy and to other nearby galaxies to vastly improve our knowledge of the scale of the Universe. The poorly known distance of the Sun from the center of the Galaxy can be measured directly and the motion of the Sun around the galactic center can be detected. For the first time, the motion on the sky of other galaxies can be directly measured. Physicists will be able to refine the light bending test of General Relativity by more than an order of magnitude, geodesists will be able to accurately determine the several motions of the Earth including Universal Time, solid earth tides and continental drift, and space scientists will be able to perform precision tracking of interplanetary spacecraft. Total construction cost (including design work) is expected to be near $60M (1984 dollars).

NTT - Envisioned as an optical and infrared telescope with light-gathering power equivalent to that of a single mirror 15 meters in diameter. It will increase, by an order of magnitude, the photon-gathering power of our largest telescopes; with the use of interferometric techniques, it will achieve high angular resolution at infrared wavelengths. It could be used to obtain spectra of faint stars, necessary for an understanding of the chemical evolution of our Galaxy, the dynamics of the galactic halo, and the ages of dwarf spheroidal galaxies. Also, white dwarfs in the nearest globular clusters can be studied. All of these problems are threshold problems in the sense that there are no nearby bright objects suitable for study. Spectroscopic studies of high-red-shift galaxies will allow us to see the 2000 to 3000 Å region in the spectra of distant galaxies and search for spectral evidence of young stars. Study of Quasar absorption lines will allow us to measure directly the chemical and isotopic composition of gas at large red shifts. Present-day spectra do not achieve a high enough signal-to-noise ratio to obtain accurate chemical composition. The combination of high spatial resolution with sufficient photon-collecting power will permit definitive infrared studies of molecular clouds and imbedded objects. Substantial further technology development is necessary before a design concept for an NTT can be selected. Present efforts are directed toward exploring two principal concepts, a multiple mirror design and a segmented mirror design. Cost estimates for construction of such a project are necessarily preliminary because of its state of technological readiness. Current estimates are in the $100M range but it will be several years before a detailed design will be available.

The submillimeter-wave radio facility - An antenna of approximately 10 meters in diameter for submillimeter wave observations at a high, dry site. It would be used to make observations in regions of the electromagnetic spectrum between 100 and 1300 microns (0.1 to 1.3 millimeter). This region has been studied very little until now. However, advances in the design and fabrication of antennas precise enough to capture this radiation as well as development of low-noise receivers to detect these signals makes it possible to construct a telescope with a large (10-meter) diameter capable of providing an angular resolution considerably better than any existing antenna. In this region of the electromagnetic spectrum there are many rotational lines of interstellar molecules. Atomic carbon can also be studied. The telescope would enable astronomers to obtain detailed structural studies of molecular clouds. The high angular resolution of this instrument can be used for studies of objects of small angular extent, such as external galaxies or the envelopes of stars losing mass. One could also study the distribution of molecular clouds in external galaxies and allow for studies of star formation in external galaxies. Current estimates of the costs for installation of such a telescope at a high, dry site are $4M (1984 dollars).

Question: How much money does NSF expect to apply to the development and planning of these activities during FY 1984?

Answer: NSF expects to apply $2.5M for design studies for the VLBA, including site selection, in FY 1984.

The Foundation is currently considering a plan to spend up to $2.4M in FY 1984 on technology development necessary for an NTT. Such a technology development program is expected to have a great deal of spin-off of value to the construction of telescopes in the 2- to 5-meter class.

Assuming a favorable outcome of the review on the proposed submillimeter-wave radio facility, the NSF plans to apply approximately $2M toward installation of this telescope at a high, dry site in FY 1984.

Question: What other national and international facilities are currently available that would perform the same functions as these three proposed facilities?

Answer: No other national or international facility is currently available that would perform the same functions as the VLBA.

A 15-meter NTT would be a unique instrument. None exists in the world.

There are no submillimeter telescopes of this aperture (10 meter) in existence. Smaller telescopes (such as 4 meter or 5 meter optical/infrared telescopes) can be used for some observations at this wavelength.

Question: Given the availability of budget resources, when would you like to see each of these facilities in operation?

Answer: If VLBA construction is initiated in FY 1985 at an optimum rate, the VLBA would be partially operational in FY 1987.

Following the choice of a design concept for an NTT, in FY 1984, a period of detailed design and cost estimation is expected that would result in a proposal to NSF in about three years. The telescope could be operational approximately 5 or 6 years after the start of construction.

Given the optimum availability of funds, the submillimeter-wave radio facility could be in operation in late FY 1985 or early FY 1986.

Question: What part of the observing spectrum would the coverage of each of these facilities encompass?

Answer: The VLBA will perform between about 7 millimeters and 90 centimeters wavelength (radio frequencies; 40 GHz to 300 MHz).

The NTT would provide light-gathering power from the atmospheric cut-off at about 0.3 microns, through the visible part of the spectrum and out, to infrared wavelengths of 20 microns.

For the submillimeter-wave radio facility, the principal spectral region would be 300 to 1300 microns (0.3 to 1.3 millimeters) for diffraction limited studies. The telescopes could also be used down to 30 microns to gather photons.

Question: What comments and recommendations did the National Academy Committee make relative to the Space Telescope?

Answer: The Astronomy Survey Committee called attention to the need for support of certain important approved and continuing programs, among which were the Space Telescope (ST), the associated Space Telescope Science Institute, and second-generation ST instrumentation. The Committee strongly endorsed ST as follows:

> "The Astronomy Survey Committee regards Space Telescope (ST) as a project of extreme importance for all of astronomy and recommends that NSF complete its development and place it into operation at the earliest possible date. This facility will represent one of the most momentous advances in astronomical instrumentation since Galileo's first telescope."

In addition,

> "The Committee strongly approves NASA's commitment to operate and support ST through an associated but independent Space Telescope Science Institute . . ." and "regards timely upgrading (of ST instrumentation) as extremely important."

Question: How have you integrated the availability of the Space Telescope with your planning for new and existing facilities?

Senator Garn—Continued

Answer: The Astronomy Survey Committee performed a comprehensive assessment of the needs of astronomy and astrophysics for the coming decade. The Committee considered the nature and state of existing programs and facilities, as well as the capabilities of proposed projects, both of those already approved such as the Space Telescope and new ones. The Committee's recommendations were designed to reflect a balanced program of space- and ground-based astronomical research in the 1980's and are based on the assumption that Space Telescope will be available as planned. The Foundation has accepted the Astronomy Survey Committee Report as the current consensus of the astronomical community and is attempting to implement its recommendations including those for existing and new facilities.

The Foundation expects that Space Telescope will provide strong pressure for ground-based follow-up observations, as have other space missions. We expect that much of the motivation for observing programs at university observatories and at national observatories will derive from discoveries made with Space Telescope.

Question: In particular, how have the funding requirements for the Cerro Tololo Inter-American Observatory, the Kitt Peak National Observatory and the Sacramento Peak Observatory been modified in order to anticipate the availability of the Space Telescope?

Answer: The planning groups of the several National Centers are aware of plans for the Space Telescope. The plans for activities in FY 1984 take cognizance of the full range of astronomical science needs, space- and ground-based. For example, in the planning for Kitt Peak National Observatory in FY 1984, the New Telescope Technology development effort is expanded to provide the technical basis for future ground-based astronomical facilities that would complement space instruments and other ground facilities. Time at existing observatories will be allocated according to established scientific competitive methods, and it is anticipated that many projects tied to the work of the Space Telescope will be conducted.

U.S. ANTARCTIC PROGRAM

Question: This year you are requesting $102.1 million for your Antarctic Program activities. This represents a 22.7 percent increase over the FY 1983 level and a 49 percent increase over the FY 1982 level. While the operations support component of this program is expected to increase by $17.9 million in FY 1984, the Antarctic research portion of the program will only increase by $1 million. Thus, since FY 1982, there is a much smaller 17.7 percent increase for the research component of the program. As you know, the Committee has been quite concerned about the escalating costs of the operation of the program and, for the first time, included a legislative cap on this portion of the program in the FY 1983 Appropriations Bill.

In your budget presentation, you make reference to the Presidential decision memorandum of February 5, 1982 on the Antarctic and state that both the President and the Congress have recognized that these responsibilities are over and above the normal activities of NSF.

Given the recognition of the unusual character of this program and its continued expected increase costs, would you have any objection to the Congress establishing the U.S. Antarctic Program as a separate account within the National Science Foundation?

Answer: The percentage increases cited are numerically correct, but to understand the real increase, additional information is needed. For example, the cited 49 percent increase in FY 1984 over FY 1982 for operations support includes fixed costs for icebreaker support that were added to the NSF budget in FY 1983 ($13.4M). Also, the FY 1984 request includes $10.8M for special capital improvements for which comparable amounts were not included in FY 1982 and FY 1983., If the FY 1984 request is adjusted to include costs comparable to FY 1982, the operations support increase in FY 1984 over FY 1982 is about 12 percent, or less than the 17.7% increase for research. It should also be noted that the inclusion of icebreaker fixed costs, beginning in FY 1983, does not represent an increase in the Federal budget but, instead, a shifting of the cost from the agency providing the service (U.S. Coast Guard) to the agency using the services (NSF).

The U.S. Antarctic Program is a separate program activity in the NSF budget, and the Office of Management and Budget, in accordance with the President's memorandum of February 15, 1982, provides NSF with a separate budget allowance for the program.

The NSF would not object in principle to Congress establishing a separate appropriation account for the U.S. Antarctic Program, but there are some potential disadvantages. It would not give significantly greater budget visibility than the separate budget activity presently in use, and there would be an increase in administrative effort to budget for and manage a separate appropriation. On balance, the present arrangement has proven to be flexible, able to respond to special needs, while avoiding some of the additional administrative complexity of a separate appropriation.

Question: The President's directive also provided that other Federal agencies may fund and undertake direct short-term programs of scientific activities related to the Antarctic. Are any such activities anticipated in FY 1984? Has NSF established a policy that such participants would bear a share of the logistics cost?

Answer: Plans have not been finalized for any such activities in FY 1984 or future years. There is the possibility that a research ship supported by another Federal agency may operate in antarctic waters during FY 1984. The sponsoring agency would be expected to pay for the cost of the replacement fuel and food obtained while in the antarctic area, but the reimbursements would not be to NSF but rather to the Department of Defense Stock Fund which owns the bulk fuel and food stocks at McMcurdo Station. There would be no impact on the NSF budget request as presented to the Congress.

NSF would provide transportation between New Zealand and McMurdo for ships, crew replacements and exchanges, on NSF funded aircraft and some nominal support services at McMurdo.

NSF has not established a set policy on other agencies sharing in the cost of logistics support for their sponsored short-term programs. Each case will have to be decided on the basis of its actual cost and impact on the existing operations support program.

Question: In FY 1983, we provided $13.4 million for the reimbursement of an icebreaker services provided by the U.S. Coast Guard. How much of these funds have been expended to date, and what is your current estimate for the remainder of FY 1983?

Answer: For FY 1983, NSF requested $13.4 million to reimburse the U.S. Coast Guard for NSF's proportional share of the Nation's polar icebreaker fleet. The Congress appropriated $4.0 million less than the total amount requested for the U.S. Antarctic Program, and since these icebreaker costs are fixed costs, the $4.0 million reduction had to be absorbed in other parts of the Operations Support Program.

NSF does not control the rate that the U.S. Coast Guard expends the funds made available by NSF. Costs for personnel would be expended on a fairly uniform basis throughout the year, but we have no basis for, or need to know, when expenditures occur for such items as maintenance, spare costs, or port costs.

To date, NSF has obligated $12.4 million of FY 1983 funds to the Coast Guard and expect to obligate about $2.0 million more during the remainder of FY 1983.

Question: In your budget justification, you cite several major issues that still need to be resolved concerning the Antarctic Program. In particular, you note that a question exist as to how major contingencies and emergencies, such as aircraft damage or fires could be funded.

What possible alternatives have you explored with the Administration to cover such contingencies?

Answer: We have not explored special alternatives to cover major contingencies or emergencies. In the past these have been met by deferring planned procurement or construction and through the regular appropriation process. Because of the fire in December 1981 that destroyed the major maintenance facility, we have included $5.8 million in the FY 1984 budget to design and construct a replacement facility.

Question: You will also note that the existing staging base of the U.S. Antarctic Program in New Zealand is beyond the point of economical repair and must be replaced. I understand that it is likely that the U.S. will pursue a policy resulting in New Zealand financing the construction of the new facilities and the U.S. negotiating a long term lease-back arrangement.

What would be the anticipated annual costs associated with this lease-back arrangement?

When would you expect the new facility to be under construction and when would the first lease payment be required?

Answer: All of the facilities in New Zealand do not have to be replaced concurrently. We are only in the preliminary stages of negotiations with New Zealand authorities concerning financing and construction of these facilities and do not know when construction can begin nor the amount of the annual lease payments. No funds for lease payments for the replacement facilities are in the FY 1984 budget request.

Senator Garn—Continued

Question: You list two major capital investment projects for the Antarctic during FY 1984. The first of these projects involves replacing a large maintenance facility complex at McMurdo Station that was completely destroyed by fire in December 1981.

What would be the total cost for this replacement facility?

When will construction begin on this facility and when will the facility be available?

Please provide for the record an expenditure plan by quarter for the replacement of this facility.

Answer: We expect the total cost of facility will be about the $5.8 million requested in the FY 1984 budget. The final engineering design costs will be funded in FY 1984 and, if possible, some of the construction material will be procured early in FY 1984 in time for shipment on the annual supply ship departing from California in December 1983. Longer lead time construction items will be procured in FY 1984 for shipment in December 1984. It is too early to develop a meaningful expenditure plan by quarter. If appropriated, we plan to obligate the requested $5.8 million to our support contractor during FY 1984.

Question: The second investment project is the initiation of a service life extension program of the two oldest LC-130 Hercules aircraft. This program is estimated to cost a total of $13.5 million over a three-year period.

What is the current replacement value of each of these aricraft?

I understand that the service life extension program would make it possible to extend the life of the aircraft an additional 10 years or 10,000 hours. At the end of that point, the aircraft would be 33 years old.

Given the harsh operating conditions in the Antarctic, do you believe that an aircraft of this age will be a reliable source of transportation?

How long will the aircraft have to be out of service in order to accomplish the service life extension?

Could you please provide for the record an annual expenditure plan for the service life extension program during the next three years?

Answer: The best available estimate of the cost to replace the two LC-130 "F" model aircraft with the current production model LC-130T is $16.5 million per aircraft plus $10.0 million for spare parts and related costs for a total estimated cost of $63.0 million (FY 1983 dollars).

The service life extension program will provide a reliable aircraft for an additional 10 years or 10,000 flight hours. They will, however, because of their age, require more maintenance on hydraulic and electrical systems than the five newer "R" models. The high cost of new aircraft makes retention and upgrade of the older aircraft increasingly more cost effective.

It is estimated that each aircraft will take about six months to be processed through the program. The first aircraft is scheduled to be inducted into the program in October 1984 and the second in October 1985.

The planned obligations by NSF is FY 1984 - $5.0 million; FY 1985 - $4.25 million; and FY 1986 - $4.25 million. The FY 1984 obligations are primarily for procurement of materials and parts. The program will be managed for NSF by the Naval Air Systems Command, and their management system will largely determine the rate of expenditures. However, it is expected that most funds will be expended in the year obligated.

Question: Could you please provide a detailed breakdown of the costs associated with the operations support program in FY 1982, FY 1983, and FY 1984 including the type of equipment procured, the description of the facility upgrading and maintenance projects?

Answer: Some detail on operations support costs is included in the table (QDT-40) attached. Major facility and maintenance items in FY 1984 are $5.8 million for replacement vehicle maintenance facility included in the Contract Support line and $5.0 million for the first increment of a Service Life Extension Program (SLEP) for two LC-130 aircraft (included in the Naval Force, other costs).

Other significant procurement are listed below by fiscal year.

Fiscal Year 1982

Building modules for William Field Air Facility	1.8M
Annual Aircraft overhaul	2.7M
Aircraft Repair Parts	.7M
Heavy Support Equipment	
1 - D-8 Caterpiller Tractor	.22M
1 - Delta 3 Personnel Carrier	.15M
2 - Snow Blowers	.07M
1 - Firetruck	.1M
2 - Dump Trucks	.17M
1 - Truck, w/Hydraulic boom and bucket assembly	.13M
Polar Clothing	.25M
Lumber and Utility Pipe	.3M

Fiscal Year 1983

Annual Aircraft Overhaul	2.4M
1 - Tactical Air Navigation System (TACAN)	.4M
1 - Communications Transmitter	.22M
Heavy Support Equipment	
2 - Spryte Track Vehicles	.1M
1 - Delta 3 Crash/Fire Vehicle	.14M
4 - Stake Body Trucks	.05M
1 - Air Compressor	.03M
1 - K-Loader (cargo carrier)	.18M
Oversnow Traverse Vehicles	.4M
Lumber and Utility Pipe	.6M
Polar Clothing	.18M
Aircraft Repair Parts	1.0M
JATO (Jet assisted take-off) Bottle Modifications*	.4M

Fiscal Year 1984

Aircraft Service Life Extension Program for two aircraft	5.0M
Annual Aircraft Overhaul	3.2M
Aircraft Repair Parts	.9M
Vehicle Maintenance Facility	5.8M
2 - TACAN Units	.84M
Heavy Support Equipment	
1 - First fighting Structural Pumper Truck	.11M
1 - Fire/Crash Vehicle, Twin Agent Unit (Chemical and Water)	.25M
Construction Material (lumber, utility pipe consumables, etc.)	.9M
Polar Clothing	1.5M

* Standard JATO bottles need special modification for Antarctic use.

ADVANCED OCEAN DRILLING PROGRAM

Question: Your FY 1984 budget requests an increase of $9.8 million from your FY 1983 level for Ocean Drilling programs. When you developed the $26.3 million request contained in your FY 1984 budget, did you assume the continuation of drilling activities with the CHALLENGER?

Answer: Yes, but we also expected that our plans might change as a result of the recommendations of the ad hoc Advisory Group on Crustal Studies. In view of a particularly favorable price situation in the oil exploration market, the ad hoc Group has recommended that a modern commercial drillship be leased as a replacement for CHALLENGER.

If CHALLENGER were to have been retained as drillship for the Advanced Ocean Drilling Program, she would have required a substantial refit and upgrading. Thus, the 1984 estimate in the budget assumed a partial year of operations, a significant capital investment (approximately $11.0 million), and an emphasis on scientific planning and preparatory activities looking toward resumption of full field operations in FY 1985.

It shold be noted that the ad hoc Group recommendation for a long term lease of a state-of-the-art commercial drillship would result in a nearly identical schedule and set of costs in 1984.

Question: Your budget justification states (Page AAEO-V-5) that "the $9.8 million increase is necessary because agreements with foreign partners provide no funds for drilling beyond the current fiscal year, nor for any alternative activities." However, the table contained in your budget justification (Page AAEO-V-1) only shows a $6.8 million decrease attributable to foreign funding. How do you explain this apparent discrepancy?

Answer: The $1.2 million in foreign contributions available for FY 1984 is provided as closeout funding under current International Phase of Ocean Drilling Agreements. It may be applied only to the final CHALLENGER/DSDP costs.

In a normal full operations year for the Advanced Ocean Drilling Program, we would expect to have international contributions of approximately $10 million toward the new program. This figure is based on informal negotiations with the current partners and on cost estimates for the leased drillship operation. We have not been able to open formal negotiations pending internal U.S. decisions about the new program. If the Congress approves the recommended program, we would expect to restore international support to approximately $10 million in FY 1985.

In essence, therefore, the $9.8 million increase in FY 1984 does reflect the lack of agreements with the international partners for the new program.

Question: On February 2, 1983, the members of your ad hoc Advisory Group on Crustal Studies recommended the use of a commercial drillship in your ocean drilling program in lieu of the current CHALLENGER. This recommendation would seem to rule out the conversion of the EXPLORER for drilling purposes. Could you please describe the recommendations contained in that memorandum and what decisions you have made relative to those recommendations?

Answer: The principal recommendations of the ad hoc Advisory Group with respect to scientific ocean drilling were:

a. Scientific ocean drilling should continue;

b. International participation should continue and be expanded;

c. A leased commercial drill ship appeared preferable to either CHALLENGER or EXPLORER.

We agree with these recommendations and are moving as rapidly as possible to implement them.

Question: Could you please provide the (ad hoc Advisory Group on Crustal Studies) memorandum for the record?

Answer: A copy of the report (NSF 33-39) is provided for the record. Recommendations on scientific ocean drilling are summarized on page 10.

Question: If it was decided that it would be best to lease a commercial drill ship for the ocean drilling program, what actions would you take relative to the CHALLENGER during FY 1984 and what costs would be incurred?

Answer: We expect CHALLENGER to operate through mid-November 1983, after which the ship will be demobilized and returned to its owners. The cost of CHALLENGER operations in FY 1984 should be about $3.7 million. Related science costs will be about $3.4 million. Of these costs, $3.2 million will be covered by reimbursement from Defense Advanced Research Projects Agency (DARPA) and international contributions.

Question: The memorandum indicates that it would required about $10 million in capital investment to modify the commercial ship for use of the program. Is this still your best estimate of the conversion costs?

Senator Garn—Continued

Answer: The 1983 estimate of $10 million (adjusted to $10.5 million for 1984) is a reasonable one at this time. A more precise estimate will not be possible until a specific ship has been selected and conversion plans drawn up. Conversion would take about 3 months, and would be accomplished in mid-1984. Following a training and shakedown period, the ship should be ready to begin scientific drilling in October 1984.

THE AD HOC ADVISORY GROUP ON CRUSTAL STUDIES

REPORT TO THE NATIONAL SCIENCE FOUNDATION—APRIL 1983

AD HOC ADVISORY GROUP ON CRUSTAL STUDIES

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INTRODUCTION AND CHARGE TO THE ADVISORY GROUP

The Ad Hoc Advisory Group on Crustal Studies was given the charge to "review long range plans for crustal studies within the university-based earth and ocean sciences." Since the crust is the product of internal and external processes acting on the earth's surface through geological time, the Group interpreted crustal studies to include relevant studies of the earth's interior as well as of the exterior processes which have affected, and continue to affect, the surface.

The second charge to the Group was to "assign relative priorities to initiatives in crustal studies in the context of likely budgets for FY 1984 and future years with particular attention to the relative priority to be assigned to ocean drilling." Scientific challenges in the solid earth sciences are many and diverse with varying requirements for platforms and instrumentation One way of grouping these is in terms of processes; the processes that produce the earth's crust. Some are no longer operating; they operated in the past and left their mark. To examine the results of these processes, we must explore, in the two surface dimensions and in depth, to see what is there and to try to determine how it got there. Other processes are now active; they are currently shaping the earth's surface, creating hazards and concentrating resources. How these processes work and on what time scales is important not only in determining what is happening now and in understanding what has happened in the past, but also in determining what may happen in the future. Lastly, there is the future. Our ability to predict future processes and the consequences of their actions depends upon our knowledge of how processes work and how they have worked in the past. Prediction extends beyond anticipation of future activity; it is also concerned with our ability to predict where resources can be found. Our models for estimating world or national resource abundances are imperfect, based on limited knowledge and current ideas. As we examine the earth we continually encounter surprises. Submersible and surface ship observations of metallic sulphide deposits associated with oceanic ridges suggest that comparable bodies on land may have formed in much shorter time periods than previously assumed. The deep drilling on the Kola Peninsula in the USSR has confirmed that our seismic refraction models may be real models of physical conditions, but that they do not reflect the detailed geology; that deep thermal gradients may be quite different from those suspected from shallow measurements; that circulation of fluids occurs at depths in excess of 10 km. at which common wisdom would suggest that there are no open circulatory systems; and that sulphide mineralization occurs at depths of 9.5 km. Deep seismic reflection profiling and tomography using seismic arrays are revealing inhomogeneities and discontinuities that were often unexpected, but in any event were difficult to demonstrate in the past.

The Advisory Group took note of the following factors in its consideration of the charge to assign relative priorities to initiatives in crustal studies:

- *the broad scope of the outstanding problems and the varied methods through which solutions to these problems can be sought.*
- *the limited charge to the Group which did not include examination of facilities which are the responsibility of other agencies, but upon which NSF supported research is based.*
- *the existence of detailed reports prepared by a broad spectrum of the crustal studies community outlining opportunities and challenges. Several of these reports are currently being drafted by the Geological Sciences Board and the Ocean Sciences Board of the National Academy of Sciences.*
- *the limited time at the disposal of the Group to discuss and prepare a report.*

The Group has emphasized particular thrusts rather than specific priorities; areas of the science in which initiatives might be expected to produce especially significant results because they are timely, because new or improved technologies have become available, or because places have been identified as ideal for their pursuit. The Group relied heavily on the background documents in identifying these thrusts.

The third charge was "within the frame work of these priorities [to] advise on the relative merits of CHALLENGER, EXPLORER, or a third platform." The budget of scientific ocean drilling was to be considered as a part of the budget for crustal studies in this review.

This raises the question of how major facilities or expensive experiments of great importance to part of the community would be dealt with by NSF or other agencies; a question that goes beyond the charges to the Group. If they are handled in competition with standard grants and democracy prevails, it seems likely that few would become available. Some facilities are the responsibility of other agencies, but are needed for NSF sponsored research. To do moon geology, one needs a booster and a module; a drillship is required to study the geology beneath the sea floor, oceanographic ships or submersibles are needed to study bottom processes, seismographic networks are required to study the deep interior of the earth. It is expensive to make deep reflection measurement on continents or oceans and even more expensive to drill deep holes. How to deal with major facilities or programs in conjunction with standard research grants is a major problem for which no easy solution has been found. The basic grants must be treasured because many of the most important ideas have sprung from them. At the same time, the major facilities or projects have provided new data impossible to obtain in any other way as well as opportunities to test new ideas not yet sufficiently advances to attract support on their own. In the earth and ocean sciences a way must be found to support "facilities" and large programs dependent upon them that will make them available in a timely manner, but will not damage the small grants.

BACKGROUND DOCUMENTS

The scientific challenges in crustal studies are many and they have been examined by many groups of experts. Some of the reports of these groups were commissioned by NSF; some generated by committees of NAS or other groups. The charges to these committees have been varied and the results show this variation. The reports made available to the Group include the following:

- *Conference on Scientific Ocean Drilling; Joint Oceanographic Institutions, Inc., Nov. 1981.*
- *Ocean Crustal Dynamics; J.O.I. Inc., June 1982.*
- *Opportunities for Research in the Geological Sciences; Geological Sciences Board, NAS, draft of report in preparation.*
- *Geodynamics in the 1980's; U.S. Geodynamics Committee, NAS, May 1980.*
- *Continental Tectonics; Geophysics Study Committee, NAS, 1980.*
- *Continental Margins: Geological and Geophysical Research Needs and Problems, Ocean Sciences Board, NAS, 1979.*
- *Global Earthquake Monitoring, Its Uses, Potentials, and Support Requirements, Committee on Seismology, NAS, 1977.*
- *Trends and Opportunities in Seismology; Committee on Seismology, NAS, 1977.*
- *Continental Scientific Drilling; U.S. Geodynamics Committee, NAS, 1979.*
- *Report on Workshop on the Lithosphere, U.S. Geodynamics Committee, NAS, final draft of report in preparation.*
- *A Strategy for Earth Science in Space in the 1980's; Committee on Earth Sciences, Space Science Board, NAS, 1982.*
- *Future of Marine Geoscience, draft report, Ocean Sciences Board, 1982. (Unpublished)*
- *Mineral Resources: Genetic Understanding for Practical Applications; Geophysics Study Committee, NAS, 1981.*
- *The Continuing Quest - Large Scale Ocean Science for the Future;*
- *Options for Scientific Ocean Drilling; Committee on Ocean Drilling; Geological Sciences Board, NAS, 1982.*
- *Report of the Ad Hoc Committee for the Examination of Long-Range Planning for Geological and Geophysical Research on Crustal Processes; AAEO/NSF, Jan. 1982.*

There are many common threads in these documents. Many note the need for drilling, on land or at sea, for solving problems related to the third dimension in these areas and for establishing the nature of the geology across the continental margins. It is obvious that there are many new technologies available that could be applied to the solution of outstanding problems, but is also obvious that much of this technology is not yet available to the academic research community and that new tools await development. It is clear that core support for crustal studies in the Earth and Ocean Science Divisions is not commensurate with the opportunities described in the above reports.

Selecting priorities from among these opportunities may become a matter of taste. If one likes apples, one selects an apple; if one prefers peaches, one chooses a peach. Given the variety of possible approaches to the solution of many significant problems, the best that one can hope for is to select the best and ripest peaches and apples. The agronomists worry that if we grow all of our corn from a single strain of hybrid seed we become exceedingly vulnerable to vagaries of blight or climate. Similarly, in crustal studies, we worry about narrowing the gene pool of our investigations. The genes of crustal studies are diverse and this diversity should be nurtured. It is primarily through the basic grants program that this is accomplished. At the same time, it must be recognized that there are specific thrusts that have the potential for making especially significant contributions to our knowledge in the area of crustal studies and these deserve special consideration. Among these is deep sea drilling, an area the Group was asked to comment upon specifically.

INITIATIVES IN CRUSTAL STUDIES

In a recent interview, King Hubbert commented:

> *"I think earth sciences are about to enter a third phase. The first was about 1780-1880 when a handful of men like Hutton, Lyell, and Darwin changed the world. They gave us a geologic view of history instead of a Biblical one. In the second stage, from 1880 until now, earth scientists became utilitarian and concentrated mostly on the search for ores, metals and fossil fuels. They did very little thinking about the broader subjects. Now is the start of a third phase when the world is heading into intellectual turmoil. It needs guidance. The knowledge essential to competent intellectual leadership in this situation is preeminently geological - a knowledge of the planet's mineral and energy resources. The importance of any science, socially, is its effect on what people think and on what they do. It is time earth scientists again become a major force in how people think rather than how they live."* (The Leading Edge, Feb., 1983)

If we are to respond to Hubbert's challenge, we must understand the nature of the earth better: we must explore it in depth; we must try to understand the processes that act upon it; we must improve our ability to predict the results of these processes.

Exploration and Monitoring

Contemporary earth science is but the modern phase of the history of man's exploration of the earth, a history that has provided both intellectual adventures and practical benefit. When viewed in historical perspective, exploration of the earth has proceeded in a remarkably rational way. As new devices, new tools, new ideas became available, exploration gradually spread to more remote, more complex, and more inaccessible parts of the earth. Early humans were confined to the vicinity of their birth, but as means of transportation developed through the horse, the ship, and the spacecraft, the outer surface of the earth was fully explored in a geographical sense. The need to understand the surface of the earth still further brought geological inquiry, first with the hammer, lately with highly sophisticated analytical devices. The extent of ocean exploration grew with the advent of the ship, the magnetometer, the submersible, and the drill. Drilling and geophysical and geochemical techniques offer means for exploring the third or depth dimension of the earth. With this background of progress in exploration and technological development, and in view of modern capabilities and opportunities, one can attempt to develop a rational strategy for the next steps in exploration of the earth.

We can begin by constructing a matrix of the subdivisions of the earth characterized in terms of how well they have been explored and of the availability of tools for exploration as an indication of their attractiveness for exploration in the near future.

1. Status of Exploration
2. Availability of Technology

SUBDIVISION	*CONTINENT*	*OCEAN*	*CONTINENT-OCEAN TRANSITION*	*DEEP INTERIOR*
Surface	*1. Good* *2. High*	*1. Good* *2. High*	*1. Good* *2. High*	------------- -------------
Sediments	*1. Good** *2. High*	*1. Fair* *2. High*	*1. Fair** *2. High*	------------- -------------
Crust	*1. Poor* *2. Modest*	*1. Poor* *1. Modest*	*1. Poor* *1. Modest*	------------- -------------
Upper Mantle	*1. Poor* *2. Modest*	*1. Poor* *2. Modest*	*1. Poor* *2. Limited*	*1. Poor* *2. Modest*
Lower Mantle	---------	---------	----------	*1. Poor* *2. Limited*
Core	---------	---------	----------	*1. Poor* *2. Limited*

** Highly explored by industry in many areas.*

As might be expected, exploration is most advanced near the surface and in areas in which economic interest is high. Nonetheless, significant exploration has been carried out in the more remote parts of the earth and more can be accomplished through the application of existing technology, although some awaits new ideas and tools yet to be developed.

A number of new concepts have been introduced in solid earth geophysics in recent years including: the idea that all departures of the shape of the earth from the hydrostatic figure are of tectonic significance; the idea that past sea level changes might be used to infer rates and times of increased sea floor volcanism at times in the past older than the oldest sea floor. Our concepts of the nature of the crust have changed radically as we have become able to probe it with new geophysical tools and the drill. We have developed new techniques to probe the earth: from techniques to probe the details of the crust to others, using fixed arrays and natural sources, to map in three dimensions the structure of the earth's interior and to investigate the deep structure of rises and subduction zones. We have techniques that enable us to obtain positions, and changes in positions, rapidly to 2-3 cm accuracy and to map features of the sea floor from space; we have new seismological techniques to measure anisotropy and, possible, stress.

Fixed seismic arrays or portable arrays operate in the monitoring mode and provide, depending on geometry, density, and types of sources, high or low resolution maps and profiles of large regions. Seismic reflection profiling is an example of a mapping experiment using active sources. Both have their roles and each addresses different questions on different scales. Measurements in wells or geochemical studies in the laboratory are also examples of experiments. Solid earth geophysics requires a balance of activities in the above types of areas as well as modelling and theoretical studies.

PROCESSES AND PREDICTION

In recent decades the geology has become a vastly more predictive science in contrast to the descriptive one of the past. There are developing, currently, predictive models for the formation of sedimentary basins and their thermal history which have a powerful impact on oil exploration. Earthquakes on plate boundaries have characteristics of displacement, recurrences, and dimensions which call for critical observations to permit predictions of their probability of occurence. The genesis of certain economically important ore bodies now can be modelled in a manner that will allow prediction of the form and distribution of ore deposits. Safe isolation of radioactive wastes, prediction of volcanic eruptions, and a variety of other fundamental geologic problems are susceptible to attack by an array of new mathematical and technological tools which allow for predictive statements based on physical models. But, now, observation of the parameters critical for such predictions have fallen behind our capacity to generate the physical models.

In oil exploration, plate tectonics plays a critical role. The basins that contain hydrocarbons are formed through thermal and tectonic processes which are linked to the manner in which continental margins formed and are forming today. The study of the processes of formation of those margins through seismic exploration and drilling to establish both stratigraphic and seismic velocity data is of the greatest importance. The use of satellite geodetic techniques to establish current plate motion rates and deformations of the continental margins offers a powerful technique to provide information for the construction of models of plate interaction that lead to basin formation.

The development of biostratigraphic zonation allowing detailed time correlations, analysis of environments of deposition and of paleoclimate plays an integral and important role in determining the evolution of sedimentary basins. These studies have predictive value in the search for hydrocarbons; they require ocean drilling and shipboard geophysical and geological measurements of current sedimentological processes.

Great earthquakes occur by rupture along faults; the formation of the instability that is a necessary precursor to the event depends on parameters measureable only through drilling. Fault zones, such as the San Andreas, need holes in critically located sites to provide measurements of the state of stress, temperature, pore fluid pressure and mechanical properties. Global Positioning Satellites promise relative location of 1 to 2 cm in the next year. These observations will allow widespread determinations of elastic strain and inelastic effects preceding great earthquakes which are required for the development of an adequate physical model for the process of rupture.

Current, well-posed models of sedimentary (Mississippi Valley type) ore deposits require boreholes and fluid sampling in sedimentary sequences through which the ore-forming fluids have passed. The investigations require new laboratory equipment for mass spectrometry and fluid chemistry analysis. If correct, these models for the genesis of sulphide ore bodies should prove to be of great benefit to exploration. The rift valleys and transform faults of the ocean ridges generate massive sulphide deposits which form through exhalation of hot, metalliferous brines. The most likely source of these brines is sea water which circulates through fractured oceanic crust by convection, driven by the ridge axis heat sources. If the circulation system can be well understood through drilling and down-hole measurements of fluid flow, permeability and fluid chemistry, there is reason to hope for better models for exploration for such deposits on the continents as well as on the sea floor. This problem requires, in addition to drilling, geophysical observations using seismic reflection, side scan sonar, heat flow, and deep submersible sampling.

Metamorphism and ore formation, earthquakes, radioactive waste disposal, geothermal prospecting, are all problems that require a combination of rock-water interaction and a knowledge of the thermodynamic and chemical kinetic parameters that allow a prediction of reaction direction and reaction extent. Direct observation of rock-water interaction necessarily means drilling; collection of cores and pore fluids in active (e.g. geothermal) areas. The thermodynamic and kinetic parameters can be gained by laboratory and theoretical modelling.

Prediction depends to a great extent on understanding what has happened in the past. Since Hutton and Lyell the concept of uniformitarianism has dominated geological thinking and gradual change has been the accepted mode of biological evolution. This acceptance was accompanied by some gnawing doubts, often associated with the incompleteness of the geological record. Recently it has been suggested that the unusual event cannot be ignored, a suggestion arising from the possibility that impacts of large extraterrestrial objects on the earth have had profound effects on the manner in which organisms, indeed, perhaps even the crust, have evolved. If this concept proves true, then it may not be the fittest who survived, but the luckiest. Hubbert's comment on the impact of earth science on how we think is particularly relevant to this concept and to the new excitement it has brought to paleobiology and geology.

INDENTIFICATION OF INITIATIVES

The Committee on Opportunities for Research in the Geological Sciences of the Geological Sciences Board (GSB), NAS, has identified eight priority topics; initiatives in which research relevant to the problems discussed above is included. Although the charge to the GSB Committee included study of activities of only the Earth Sciences Division, most of the initiatives in ocean crustal research, described in the COSOD report, the report on Ocean Crustal Dynamics, and the report on marine geology and geophysics under preparation by the Ocean Sciences Board, can be grouped under the same general headings. These topics, modified to include ocean crustal studies as well as continental, are:

- *Structure and Composition of the Lithosphere. The lithosphere includes the crust; in the context of this Committee, this initiative would include the lithosphere beneath continents, oceans, and the transition zones between them.*

- *Sedimentary Basin Formation. This would include basins on land as well as those in the oceans. Most of the major sedimentary basins in the oceans are along continental margins. It is of particular interest to tie the land results together with the information gained through marine investigations in these areas.*

- *Magma Generation. Magmas are the ultimate source of all surface rocks and the processes that produce them are active both beneath the continents and under the sea floor.*

- *Physical and Chemical Properties of Rocks. The rocks are the record from which we read the record of earth history. Fundamental to reading this record is an understanding of their chemical and physical properties.*

- *Tectonic Processes. Plate tectonics has provided us with a framework in which to place the observations which have been and continue to be collected. Understanding what makes plate tectonics work and how tectonic processes work now and have worked in the past is critical to understanding the geological record.*

- *A Model for Convection in the Earth's Interior. Movement of continents was rejected in the past for want of a driving mechanism. Acceptance came from measurements that indicated that the continents had indeed moved, not because a mechanism was discovered. Considerable progress has been made in modeling convection in the earth's interior, but major uncertainties still exist.*

- *Paleobiology. Recent investigations suggest support the concept that punctuated evolution may be real and that it is not just an artifact of the geological record. The origin and evolution of life, the causes of mass extinctions and explosive evolution are major scientific challenges.*

- *Surficial Processes. The earth is shaped by both internal and external processes. There is much to be learned about how these work. Only recently has it become apparent that areas of the deep sea floor are being exposed to storms, some of which appear to be related to storms in the atmosphere.*

To the above must be added one additional initiative, not included in the Geological Sciences Board because its focus was on the responsibilities of the Earth Sciences Division.

- *Paleo-oceanography and Paleoclimatology. The marine record of earth history is important because only in the sea can the information be recorded continuously. The sedimentary layers of the deep sea are important because they record layer by layer different historical states of the earth and how and when it passes from one state to another. The pages of this record are very thin because sedimentation rates are slow, of the order of a few centimeters per year. Earlier deep sea drilling disturbed the cores and lowered their time resolution, but the Hydraulic Piston Corer and the new Extending Core Barrel now make it possible to recover undisturbed cores and to learn the details of this history.*

The report of the Geological Sciences Board calls special attention to the significance of scientific drilling, including the drilling of dedicated holes on land when it is appropriate, of seismic profiling and seismic networks, of the need for major laboratory and field equipment to respond to these initiatives, and to the ever increasing problem of data management.

The Ad Hoc Group on Crustal Studies did not assign specific priorities to initiatives in crustal studies in the short time available to it, but it notes that the principal thrusts identified during its meeting fall within the categories identified by the Geological Sciences Board with the additions and modifications included above.

SCIENTIFIC OCEAN DRILLING

Finally, and in response to the charge from NSF, the Group specifically considered scientific ocean drilling and the question of what platform would be most appropriate for a drilling program should it be continued. The conclusions of the Group are as follows:

The Group was unanimous in its opinion that scientific drilling, with its present international character, should continue - indeed, that additional foreign participants be invited to join.

Three options were considered for a platform; EXPLORER, CHALLENGER, or a third platform. The EXPLORER was attractive when the Ocean Margin Drilling Program was in its early stages because it had the capacity to handle the very long riser string necessary for drilling controlled holes in water depths of 10,000 ft. or greater. In addition, the large size provided more space for participants and laboratories and the better seakeeping properties made it possible to work in higher latitudes than could CHALLENGER. However, with the abandonment of OMDP and postponement or termination of riser drilling, this option became less attractive in view of the heavy conversion and development costs. In the context of the budget projections presented by NSF, the Group was unanimous in its opinion that this was not the route to follow.

The second option was to refit CHALLENGER and to extend her service by a few years. CHALLENGER will require overhaul and refit to continue in service and would still be limited in capacity and considerably behind the state of the art of modern drilling vessels, but this option could be followed if no better platform were available at reasonable cost.

Because of present conditions in the petroleum industry, a third option now exists. There are at present four to six modern commercial, dynamically positioned drilling vessels with the capability of carrying out deep sea drilling. Because of the weakness in the market for offshore drilling rigs, it appears that a vessel of this type could be available for lease at this time on very favorable terms. These vessels have more space, greater sea-keeping ability, can handle longer drilling string than CHALLENGER and are equipped to handle riser in water depths up to 6000'. The Group feels that this new option, not available earlier, is the most desirable for continuation of ocean scientific drilling.

This recommendation is made in the context of budget projections presented by NSF. The Group is aware that the costs of equipping and operating such a vessel are considerable and that the needs for additional funds in Earth and Ocean Sciences to upgrade basic grants programs, for instrumentation, and to respond to the challenges from other initiatives are high. Therefore it is the opinion of the Group that it should be a goal of the Ocean Scientific Drilling Project, using a modern, leased drilling vessel, to obtain at least half of the total funds required from foreign participants to allow, within the total budget, pursuit of other important initiatives. We recognize that this may not be possible during the coming year, but it should be achievable in future years.

Senator Garn—Continued

GROUND-BASED ASTRONOMY

The National Science Foundation maintains the permanent role in supporting ground-based astronomy. Since 1976, the Foundation has provided about 67% of all Federal support for this astronomy program. Consistent with this lead role, the Committee in its FY 1983 Senate Report stated, "The Committee expects that funding for the infrared telescope facility in Hawaii be considered as part of NSF's Fiscal Year 1984 budget. Therefore, the Committee directs the Foundation to review the funding needs of this facility.' As you are well aware, this facility has been supported for some time by NASA and the Senate Committee Report indicated that the Committee did not believe that NASA was necessarily the logical place for the funding of this program. In fact, during FY 1982, NASA only reluctantly agreed to fund the program after strong Congressional interest.

Question: Before preparing your FY 1984 budget submission, did you consult with NASA to determine the appropriate role of both agencies?

Answer: The NSF role as the lead agency for ground-based astronomy has never been envisioned to mean that NSF should be the only agency supporting this type of activity. The Foundation strongly encourages other federal agencies to support basic research in areas related to their missions. In particuar, the Foundation strongly urged NASA to continue to support operation of the Infrared Telescope Facility (IRTF).

During preparation of our FY 1984 budget, NASA and NSF program staff were in frequent personal and telephone contact on the issue of the future of the IRTF. In addition, NSF explicitly raised the issue of funding responsibility for the IRTF with the Office of Management and Budget.

Question: What formal agreements or understandings were arrived at in these "pre-budget" meetings?

Answer: The understanding which emerged from these discussions was that NASA would support the operation of the IRTF in FY 1984.

Question: What is the current status of this discussion?

Answer: A two-member interagency task force is preparing a formal memorandum of agreement between NASA and the NSF on operational support of the IRTF.

Question: Has NSF established a review committee to determine the appropriate funding mechanism for the infrared telescope facility?

Answer: No.

Question: I would like the Foundation to report back to this Committee by May 26 indicating the pros and cons of funding the infrared telescope through the Foundation rather than NASA.

Answer: The following pros and cons have been provided the Committee in a separate report.

Senator Garn—Continued

PRO

- NSF is the lead agency for ground-based astronomy, providing about two-thirds of the total federal support in this area.
- NSF has wide experience in supporting ground-based facilities available to the astronomical community on the basis of scientific merit.
- NSF support for operation of the IRTF would involve peer review, thus, providing for competition on the basis of scientific merit.
- NSF currently supports several research groups who use the IRTF, specific items of general astronomical instrumentation for the IRTF, and travel costs for IRTF users given time for work in non-solar system areas.

CON

- Transfer of the IRTF from NASA to NSF would further increase the concentration of support for ground-based astronomy in a single agency.
- NASA has extensive experience in the construction and management of the IRTF, meeting NASA program objectives and providing the remainder of the observing time to the astronomical community on the basis of scientific merit.
- NASA has a continuing need for approximately one-half of the observing time on the IRTF and, by providing long-term operational support for the facility, can assure that its mission-oriented objectives will be met.
- NASA has included operating support for the IRTF while the NSF has made concentrated efforts to strengthen other aspects of ground-based astronomy in the FY 1984 budget request.

RECOMMENDED CONCLUSION

While it is true that operation of the IRTF has similarities to operation of other ground-based facilities supported by the NSF, continued operation of the IRTF by NASA seems appropriate in this particular case.

INFORMATION SCIENCE AND TECHNOLOGY

Question: One of the programs undertaken within your information science and technology activity relates to pattern recognition applied to information system design.

What is the importance of this activity in terms of the development of automated systems and robotics?

Answer: The research support in pattern recognition for information system design is not focused specifically on robotics and automated systems in the Information Science and Technology subactivity. Research here emphasizes understanding the underlying aspects of pattern recognition in a variety of areas such as text, the structure of information constructs in biological systems, optical character recognition, and knowledge-based patterns in expert systems. While this research has implications for industrial robots and other classes of machines, it is not targeted explicitly at them because these latter have unique and restricted characteristics.

Question: What have been the major scientific and technical accomplishments of this program during the last several years?

Answer:

- The application of computer-based semantic pattern recognition techniques to the problem of information retrieval; this has the potential for application in such areas as medical diagnosis, trouble-shooting, system design, photointerpretation, and robotics.

- Research on the structure of information patterns contained in natural language text. It has been shown that the essential information contained in natural language text is retained after this material has been reduced to fundamental elements (pronouns, verbs, prepositions). The practical significance lies in the fact that it may be possible for a computer to extract these key elements from a body of text automatically, regardless of the language in which it is written, and to store and manipulate them without loss of information.

- Research on how to use computer systems to generate, represent and display textual and graphic information with important applications for many areas of information presentation, including technical illustrations which combine text and graphics, a programming language for the design of Chinese characters, the schema of a data base, and the logical structure in a drawing.

Question: What additional work or issues need to be address in this area?

Answer:

- Research on the theoretical foundations of information science.

- Research on the structure of information patterns.

- Research on human-machine information transfer processes and technologies.

- Research on economic and social effects of information technologies, including impacts on the structure of industries and the labor force.

Question: How many applications did the Foundation receive for funding and what was their total cost during FY 1982 and FY 1983?

Answer:

	FY 1982	FY 1983 (Through April 30)
Total Number of Proposals	166	136
Total Funding Requested	$ 1[illegible].3M	$11.5M
Total Number of Awards	7[illegible]	42
Total Funding Granted	$ [illegible]M	$ 2.8M

Question: What additional basic research needs to be undertaken in the information science program area?

Answer: The highest priority is to define the theoretical foundations of the discipline. It includes the development of basic theories of information which will extend the existing entropy, probabilistic, fuzzy set, and vector space models of information. A more complete understanding of information processing in living organisms, including humans, is also needed.

Question: Although the dollar values are small, I note that you are requesting a 67.5% increase for your information technology subactivity and a 37.5% increase for your information impact subactivity. However, information science, while still remaining the major emphasis in your FY 1984 program, is maintained at the FY 1983 level.

Do you believe that additional resources could not be used productively in the information sciences area?

Answer: The budget requested for this activity was determined in accordance with the priorities for the Foundation at large within the constraints established by the total budget. It was felt that the maximum benefits could be obtained by allocating the increase to Information Technology and Information Impact Programs. Both programs have been operating below $1 million and the $700,000 increase will respond to emerging research opportunities in these developing areas.

The Information Technology Program will begin to emphasize the development of instrumentation for research in experimental information sciences, which has, until now, been largely a logical science. Thus, the investment in the Information Technology Program will provide direct benefits to information science. The Information Impact area is increasing in importance as the nation is confronted with structural changes in the economy and the workforce as a result of the introduction of information intensive technology.

ENGINEERING AREAS OF NATIONAL IMPORTANCE

In describing your engineering activities for FY 1984, you note that in addition to discipline-oriented research, there are a number of emerging areas critical to the nation's economy and national security in which basic engineering research plays a key role. Among these areas are automated manufacturing and robotics, biotechnology, extractive metallurgy and mineral separation, and microelectronics fabrication. On page ENG-5 of your budget justification you list several activities under your electrical, computer and systems engineering program as well as your mechanical engineering in applied mechanics program that address these areas of "national importance".

Question: Could you please describe the activities that have been undertaken in each of these two programs in FY 1983 and the types of research you anticipate will be undertaken during FY 1984?

Answer: In the effort described above (i.e., automated manufacturing and robotics), the divisions of Electrical, Computer, and Systems Engineering and Mechanical Engineering and Applied Mechanics are preeminent. Some of the activities undertaken in FY 1983 in conjunction with this effort include modeling methods (i.e., improved methods of representing physical robotics systems analytically), simulation methods (computer simulation of robotics dynamics), vibrational phenomena (effects of vibration on robotic system performance), and robotics tribology (research related to friction, lubrication, and wear in robotics systems). In FY 1984 expanded efforts include man/machine of interactions between human operators, computers, and robotics systems, advanced dynamics and control research, simulation software for robotics systems, and modeling and simulation of intelligent robot assembly systems.

Queston: What process did NSF use to identify the importance of these areas to our national economy and national security?

Answer: Engineering on its own does not identify research areas critical to the national economy and national security. What it does do is identify those technologies that offer research opportunities, and these technologies are often times picked up by or are in the process of evolving in the marketplace. Thus Engineering is technology driven, but application motivated.

Engineering has a variety of mechanisms to explore and examine these emerging technologies. Some of these are:

- An advisory committee structure that provides advice at the directorate level as well as separate subcommittees for each division and for the earthquake engineering program. From these committees come important ideas as to programmatic direction.
- Interaction with other federal agencies at both the program and policy levels. Members of the Advisory Committee include people at DOD and NBS. The Earthquake Engineering program is formally coordinated with other related activities, both through a White House committee on emergency preparedness and a FEMA committee, which develops a government-wide program plan. In addition, senior members of the directorate have met with other agencies in a one-on-one review of program plans and budgets. The Assistant Director of Engineering is currently a member of a group convened by Secretary of Commerce Baldridge to meet with spokesman of industries facing strong competition from Japanese firms. Each program director is responsible for interacting with his counterparts at other agencies on both programs and specific projects where there may be mutual interest.

- Meeting with representatives from the robotics, semiconductor, computer, and telecommunications industries.

- Support of a major study by the National Academy of Sciences on engineering research and education. Other interactions include those with the Manufacturing Studies Board, the Board on Earthquake Research, and the Board on Water Science and Technology. In addition, the directorate has been involved in several committees of the NAE, including the regular meetings of the presidents of the major professional societies in engineering, where the concerns of each group are presented and reviewed.

Question: Could you please provide for the record a listing of those research programs, regardless of disciplines, that were considered to be of major national significance?

Answer:

In Electrical, Computer, and Systems Engineering:

- VLSI and Computing Devices Research
- Optical Communications
- Remote Sensing
- Large Scale Computer Communications Networks
- Electro-Optical Devices
- Bioengineering and Physiological Systems Analysis
- Lightwave Technology
- Systems Analysis and Robust Design
- Computer Aided Design
- Magnetic Information Technology
- Software Engineering

In Chemical and Process Engineering

- Extractive Metallurgy of Iron and Steel
- Novel Separation Processes
- Electrochemical Engineering
- Enzymatic and Microbial Processes
- Biochemical Engineering
- Macromolecular Engineering

In Civil and Environmental Engineering

- Civil Engineering Systems
- Construction and Architectural Engineering
- Infrastructure (roads, bridges) Research
- Earthquake Hazard Mitigation

In Mechanical Engineering and Applied Mechanics

- Thermal Systems
- Dynamic Modelling of High Speed Machine Systems
- Measurement and Signal Processing Techniques Related to Robots

ENGINEERING RESEARCH PRIORITIES

Your FY 1984 budget request for your engineering programs is $123 million. This represents an increase of $22.2 million or 22% above the FY 1983 current plan. Your budget justification indicates that in FY 1984 emphasis will be placed on research and microelectronics and on work related to automated manufacturing, robotics, biotechnology and the development of novel chemical and separation processes central to chemical processing technology.

Question: Could you please indicate the number of additional grants expected in each of these areas as a result of this 22% increase?

What percentage increase in grants does this represent over the FY 1983 levels?

AUTOMATED MANUFACTURING AND ROBOTICS:

FY 1983	FY 1984	% Increase In Awards
$ 6.0	$ 9.0	
65 Awards	95 Awards	46%

BIOTECHNOLOGY

FY 1983	FY 1984	% Increase In Awards
$1.725	$3.05	
25 Awards	45 Awards	80%

UNCONVENTIONAL SEPARATIONS PROCESSES:

FY 1983	FY 1984	% Increase In Awards
$ 1.5	$ 2.1	
25 Awards	35 Awards	40%

NOVEL CHEMICAL PROCESSES

FY 1983	FY 1984	% Increase In Awards
$ 1.2	$ 1.7	
19 Awards	27 Awards	42%

MICROELECTRONICS FABRICATION

FY 1983	FY 1984	% Increase In Awards
$ 5.5	$ 7.2	
65*	85*	31%

* Includes 2 grants to submicron for $1.5 million.

AID FOR THE U.S. MACHINE TOOL INDUSTRY

On February 14, you issued a news release concerning a National Academy of Engineering Panel Report on the U.S. Machine Tool Industry. The report concludes that the U.S. Machine Tool Industry, a vital cog in this country's industrial progress and national secutiry, is facing a bleak future because of its sharply declining share of international and domestic markets.

Question: Could you please place a copy of the News Release in the record at this point?

Answer: A copy of the news release is attached.

NATIONAL SCIENCE FOUNDATION NEWS

RX FOR AILING MACHINE TOOL INDUSTRY: SELF-HELP WITHOUT MASSIVE FEDERAL AID

The U.S. machine tool industry, a vital cog in this country's industrial progress and national security, is facing a bleak future because of its sharply declining share of international and domestic markets, a National Academy of Engineering panel told the National Science Foundation today.

The most compelling reasons for the decline "almost certainly" lie within the American industry itself, the Academy panel concluded. Most important are the industry's failure to keep pace with technological change, notably in computerized manufacturing, and its long-standing reluctance to exploit fully international markets.

The future of the industry is "distinctly insecure," the panel said, unless fundamental changes are made in the way it operates. Industry self-sufficiency is the key to an improved outlook, the panel concluded. Although it predicted that government support will be needed to aid the industry's self-sufficiency, the panel did not foresee need for any "long-term giveaway."

In 1977, the latest year for which figures are available, there were an estimated 1,340 machine tool-building companies in the country. Most of these companies, the panel noted, are small, privately held firms. Sixty-five percent have fewer than 20 employees, and many are family-owned. Total employment was estimated at 100,000 in 1981, and total industry shipments during that year were valued at approximately $5.2 billion.

Despite the industry's small size, the panel found machine tools to be "crucial elements" in increasing industrial productivity. "Virtually every major manufactured product," it pointed out, "is produced on machine tools or on machines built by machine tools." These tools include lathes and other powered devices that cut, form, or shape metal. The nation's ability to compete globally in electronics, optics, aerospace, and other high technology industries, and to produce advanced weapons for national defense "depends in no small way on the availability of machine tools and on their continued technological improvement," the panel concluded.

The panel cited trade issues as "the most important topic currently confronting the industry." The U.S.'s share of world exports of machine tools has declined steadily over the past two decades from approximately 23 percent of the world total in 1964 to less than eight percent in 1981, according to the panel. The U.S. has dropped from the world leader in machine tool exports and now trails West Germany and Japan in world market shares.

Even worse, for the past three years, the U.S. has had a negative trade balance in machine tools--an unprecedented development in the history of the industry. Imports increased from 4 percent in 1964 to 24 percent in 1980. In 1980 alone, the panel noted, imports outstripped exports by U.S. firms by over $500 million.

Why the decline? "American tool builders," the panel explained, "have traditionally not had a strong export orientation." The large domestic market has provided little incentive for the industry to look overseas. The panel also pointed out that language barriers and legal complexities appeared formidable to the characteristically small machine tool builders, most of whom are "undersupplied with legal and administrative staff."

In addition, as in most metal-working industries, the machine tool industry suffers from sweeping oscillations in sales, with great demand peaks followed by steep declines in orders. This cyclical domestic market causes a number of major problems in the industry, notably with manpower and capitalization.

Fortunately, however, machine tool demand does not wax and wane in unison throughout the world. "The world export market, therefore, represents an important means by which the American industry could buffer the cyclical nature of domestic demand," the panel said. "It is this potential stablizing opportunity which is lost to the industry with the decline in its share of world machine tool exports."

The panel suggested as "a desirable national objective" an increase in exports to maintain at least a 15 percent lead over imports, focused on the exportation of high-technology machine tools and importation of lower-technology equipment.

The government can assist industry in reaching this goal by establishing a "coherent national export policy," the panel said. Current policy, it found, is "a complex maze of procedures and cross-cutting objectives" to most machine tool manufactures. The panel also recommended:

- government financial assistance for participation in international trade fairs and standards-setting conferences; and
- government sponsorship of an international computer network to access information needed for bidding on foreign contracts.

The panel found that the United States has not only lost its initial lead in computerized automation to Japan, but also that its manufacturing and production technology is "significantly below the state of the art attained by leading international competitiors." This current sorry state, the panel said, is due to a variety of factors. For example, the machine tool industry is undercapitalized to support research and development and to modernize its own production processes. Japan, West Germany, France, Italy, and Britain all extensively support and direct their machine tool industries, the panel noted. These nations also have close ties between their industries and academic research programs, or in some cases, national technical center jointly funded by industry and government.

U. S. machine tool firms, in contrast, tend to be "highly competitive, independent, and individualistic." They have shied away from the kind of cooperative ventures common in other countries, in part, because of fears of antitrust violations. Even recently issued guidelines have failed to reduce the industry's uncertainties about antitrust action. However, the panel said, such fears are often exaggerated and inhibit innovative ways of increasing sales or improving generic research and development.

The U.S. machine tool industry must now move rapidly into computerized production in order to remain competitive, the panel concluded. Government, it added, can help speed adoption of new technology and a general rejuvenation of the industry by:

- supporting manufacturing research with broad industrial applications and consolidating that support in a single agency;
- establishing procurement policies that provide funds for research;
- setting up generic technology centers for developing new manufacturing processes; and
- providing tax write-offs for research and development and additional tax incentives to encourage small producers to join together to form trading companies.

The committee also proposed review of current loan practices of the Export-Import Bank of the United States because the minimum loans usually are too large and must be paid back too quickly for small companies to qualify for them.

The panel identified a shortage of design engineers and skilled laborers as a major internal problem of the machine tool industry. Chronic skill deficiencies exist in a variety of areas ranging from the managerial to the shop level. For example, the average age of machinists in America industry is 58, and unless training is accelerated, a shortfall of about 20 percent has been forecast by the end of the 1980's. The panel recommended that:

- industry endow chairs in disciplines related to manufacturing and develop alliances with universities to solve manufacturing problems;
- government support be provided for about 300 Ph.D.'s in manufacturing engineering a year, with the estimated $5 million cost distributed annually through the National Science Founation; and
- industry and government jointly support vocational training.

Product liability laws, the panel found, are "perhaps the most urgent regulatory threats." Because machine tools are used for a long time, frequently change ownership, and often are used to do jobs for which they were not designed, the industry "is especially vulnerable" to litigation for injuries caused by machine tools. The economic threat is serious enough that the panel called for immediate action by state legislatures and the federal government. Short-term options include limitations on the time for filing litigation and on the size of settlements, the panel said. Among solutions that will take longer to initiate, the panel discussed national liability insurance or an industry-wide insurance fund.

The study, funded by the National Science Foundation, was conducted by a panel of the Committee on Technology and International Economic and Trade Issues, a unit of the

National Research Council, in cooperation with the National Academy of Engineering's Office of the Foreign Secretary. E. Ray McClure. program leader, precision engineering program, Lawrence Livermore Laboratory, chaired the Machine Tool Panel, and Paul R. Schulman, political science department, Mills College, was the rapporteur.

Other members of the panel were Anderson Ashburn, editor, American Machinist, New York City; Ralph E. Cross, Sr., former chairman of the board, Cross and Trecker Corp., Bloomfield Hills, Michigan; M. Eugene Merchant, director of research planning, Cincinnati Milacron, Inc.; R. V. Miskell, manager, electrical and instrument engineering department, Oak Ridge National Laboratory, Tenn.; Wayne R. Moore, president and chief executive officer, Moore Special Tool Co. Inc., Bridgeport, Connecticut; Philip F. Ostwald, department of mechnical engineering, University of Colorado; Benjamin A. Sharman, director, international affairs, International Association of Machinists and Aerospace Workers, AFL-CIO; Donald N. Smith, director, industrial development division, Institute of Science and Technology, University of Michigan; Eric P. Thor, Jr., vice president and senior economist, Bank of America, Los Angeles; and Jiri Tlusty, department of mechnical engineering, McMaster University, Hamilton, Ontario.

Marlene Beaudin of the NAE Foreign Secretary's Office was study director.

Senator Garn—Continued

Question: What, if anything, does the Foundation intend to do in order to implement these recommendations?

Answer: The National Science Foundation supports research on manufacturing through the Production Research program, funded at $3.6 million for FY 1983 and $4.6 million for FY 1984. This program has thirteen projects relating to machine tools. In addition, it administers five such projects under the Small Business Innovation Research Program, and funds manufacturing engineering research with the Industry/University Cooperative Research Projects. Persons prominent in the machine tool industry review this program's proposals and serve on its advisory panel.

The Foundation's Industry/University Cooperative Research Centers Program is an additional source of funds for manufacturing engineering. It provides partial support for Centers on Welding (Ohio State University), Robotics (Unversity of Rhode Island) and Material Handling (Georgia Institute of Technology). A fourth such center is under consideration.

Graduate students work on virtually all of the projects located at universities. Exact figures are not available, but it is estimated that 100 to 150 students are working on the program at any one time. Many of these attain the Ph.D. and go into manufacturing engineering jobs.

There are about half a dozen universities having strong and comprehensive programs in manufacturing engineering. About forty more are struggling to establish such programs.

Question: Does the Foundation agree with the panel's findings on the state of American machine tool industry, and that it is a "crucial element" in increasing industrial productivity?

Answer: Yes. Machine tools make both products and other tools. Conception of new kinds of tools and improvements of present types are essential in order to make thse products faster, at lower cost, and of better quality. It cannot be emphasized too strongly that the industry is an essential foundation stone for the Nation's productivity as well as for its defense.

MINORITIES AND WOMEN PROGRAMS

Question: How much are you requesting in your budget for your Minorities Research Initiation Program and your Visiting Professorship for Women Program during FY 1984 and how does this compare to your FY 1983 level?

Answer: The FY 1984 Budget requests $2 million for the Minority Research Initiation program which is the same level as the FY 1983 Current Plan. In the Visiting Professorships for Women program, the FY 1984 request is $1 million or $500,00 less than the FY 1983 Current Plan; however, an additional $500,000 in FY 1984 will be provided by the Research Directorates for this program to raise it to the same level as the FY 1983 Current Plan.

NSF BILATERAL AGREEMENTS

Question: In FY 1984, you are requesting $5.9 million for the support of research conducted under bilateral agreements. In addition, you are requesting $2 million to initiate a new U.S./India Joint program. What was the basis for the selection of India for this joint program? What specific activities will be the focus of the program? Has the Foundation or the Administration made any long term commitments under this program that would extend beyond the end of FY 1984?

Answer: The Indo-U.S. Science and Technology Initiative grew out of discussions between President Reagan and Prime Minister Gandhi in Washington, D.C. in July 1982. The focus of the Initiative is on new cooperative efforts to which both sides will contribute on equal basis and which respond to specific interests and needs in both countries. Projects undertaken through this program are to augment, not replace, cooperative activities being carried out through other mechanisms.

In January 1983, a Senior Scientific Panel met in India to identify areas of cooperation under this Initiative. In its report to the President and Mrs. Gandhi, it outlined four major initial areas: (1) Health (infectious diseases, blindness, and fertility), (2) Agriculture (nitrogen fixation and nitrogenous fertilizers) and Biomass Production, (3) Monsoon Predictability and Variability, and (4) Decentralized Electric Power Sources (photovoltaics).

The NSF has been designated the U.S. Executive Agent for the Initiative. As such, it is responsible for coordinating all program activities on a government-wide basis. In addition, NSF has lead technical responsibility for implementing project activities in the area of Monsoon Predictability and Variability. Other agencies with major technical responsibilities are the Department of Health and Human Services/Public Health Service, the Agency for International Development, and the U.S. Department of Agriculture/Forest Service. The requested $2 million would be used to assist all agencies support start-up activities in these areas in FY 1984.

The Report of the Senior Scientific Panel, which has received White House approval, recommends that the first group of projects discussed above be implemented over a period of 18-24 months. Thus, it is anticipated that the program will extend beyond FY 1984. At the end of this initial 18-24 month period, a Senior Policy Group, chaired on the U.S. side by the President's Science Advisor, will determine whether these activities should be continued, modified, or terminated and perhaps replaced or augmented by new activities. These decisions will be based in part on the recommendations of an expert oversight panel established by the National Academy of Sciences pursuant to the recommendations of the January 1983 Senior Scientific Panel Report.

Senator Garn—Continued

Question: Of the $12.9 million designated for International Cooperative and Joint Programs, $7.9 million will be funded within your regular research activities and only $5 million will be funded under your Scientific, Technological and International Affairs Program. In the past, these international agreements have been funded out of the scientific affairs program. How will this shift of funding responsibility to the discipline-oriented research activities change the nature of these projects that are likely to be funded?

Answer: We do not expect major changes in the nature of the projects to be funded in NSF's international programs with the shift in some funding responsibilities to the activities outside Scientific, Technological and International Affairs. NSF's new management plan will provide for more interaction between the international programs staff and program officers responsible for domestic programs. This system will better acquaint the domestic program officers with opportunities in international science and ensure that their judgements concerning which proposals best fit with U.S. priorities and interests are incorporated in NSF's decision processes for international awards. NSF will fulfill its commitments in bilateral agreements with counterpart agencies in each cooperating country, using the $12.9 million budget request as the base for these activities in FY 1984.

RISK ANALYSIS

Question: You indicate in your budget justification that increased emphasis and support would be placed on a new research effort in risk analysis. I wholly agree with your assessment that this is an issue of "growing importance in the regulatory policy area." How much money do you intend to devote to the issue of risk analysis in FY 1984 and what aspects of risk analysis would you expect to be funded?

Answer: In response to encouragement by the Congress, the Division of Policy Research and Analysis (PRA) initiated a program of research in risk analysis in April 1979 as part of the Technology Assessment program.

Since the initiation of this effort, over 20 projects in risk analysis have been funded out of the Technology Assessment and Risk Analysis (TARA) budget to risk analysis. Research projects will be funded in the five areas identified by the National Academy of Sciences Committee on Risk and Decisionmaking, i.e.:

- o Generating Risk. This research will attempt to clarify the processes by which risk are generated.
- o Coping with Risk. This research will examine both current and untried strategies for dealing with risk and the implications of these strategies for decisionmaking.
- o Risk Analysis. This research will continue efforts to improve methods for formal risk analysis.
- o Risk Indicators. This research will attempt to develop descriptive indicators of risk.

- Evaluation of Risk. This research will include behavioral and descriptive studies on how experts and lay persons perceive risks and make choices.

Within the funds allocated for Risk Analysis, we plan to set aside $300,000 for a solicitation in the area of Alternatives to Regulations for the management of risks, e.g. (1) common law liability systems; (2) insurance or compensation systems; (3) private self-regulation systems; (4) negotiation and related methods of conflict resolution; and (5) economic incentives fostered by government action.

FUNDING FLOORS FOR STIA

In your FY 1984 budget request, the amount shown for International Cooperative Research, Undergraduate College Research Support, Visiting Professorships For Women and Experimental Programs To Stimulate Competitive Research represent what you have established as minimum funding levels. You state in your justification that the total amounts finally oligated in all of these programs will depend on the quality of the proposals received.

Question: Have you established target ceilings for each of these program areas?

Answer: Since FY 1984 will be the first year NSF implements the new management practice of shared responsibility among Foundation activities, we have established only one funding level for each of these programs, the minimum funding level. This level is based upon experience and reflects a predicted response from the research community.

Question: If the Foundation received a large number of high quality proposals in these areas, resulting in funding requirements above those anticipated in your budget, from what program areas would these additional amounts be reprogrammed?

Answer: Additional amounts would come from the discipline-oriented research activities. However, the precise method of responding to proposal pressure under the circumstances you describe has not been set. We are still exploring alternatives, and responsibility for developing an implementation plan has been assigned to the Assistant Directors, operating as a special steering group.

SCIENTISTS AND ENGINEERS IN THE 1980'S

Question: Could you please provide for the record, your current estimate of supply and demand for scientists and engineers by discipline for the decade of the 1980's?

Answer: A survey of 197 industrial firms carried out in the summer of 1982 showed a rough balance between supply and demand. A majority of firms reported that it was easier to hire new scientists and engineers in 1982 than it had been in 1981. Vacancies for scientists and engineers and job offers to recent graduates with bachelor's degrees in science and engineering fields both declined by about 25 percent. Shortages (defined as situations in which more than 40 of the respondents reported that they were unable to find enough qualified applicants to fill their vacancies) were noted in the following areas: (1) electronic engineers with master's degrees, with 43 percent of employers reporting fewer qualified applicants than vacancies, and (2) the office machinery (including computers) and utility industries, with a significant fraction of employers (67 and 57 percent, respective) reporting difficulty in filling positions. In contrast, shortages were noted in 1981 in most engineering and computer science fields. A separate survey of 181 engineering colleges found faculty vacancy rates of 10 percent in engineering departments.

NSF projections for 1987 show possible shortages (defined as a situtation in which requirements exceed available supply by at least 10 percent) in some engineering and computer specialties. These projections were based on four scenarios representing combinations of low and high macroeconomic growth (annual rate growth in real GNP of 1.6 and 4.3 percent) and low and high annual growth rate in real defense expenditures (3.1 and 8.1 percent, respectively). Based on these scenarios, the projection models indicate likely shortages in aeronautical engineering and computer specialties and, under the high growth assumption, potential shortages in electrical/electronic engineering.

Assessment of future labor market conditions is an extremely complex task. Thus, some limitations to this type of analysis should be noted. First, the projected outcomes depend significantly on the validity of the assumptions underlying the four scenarios posited. Second, because of data limitations, the findings are at a high level of aggregation and may thus fail to identify different situations in subspecialties. For similar reasons findings at an aggregate level may not identify variations among other subgroups, such as individuals with substantial work experience.

For more information, refer to the following Science Resources Studies Highlights, available from the National Science Foundation:

- "Labor Market Slackens for New Science and Engineering Graduates." NSF 82-330; November 22, 1982.
- "Engineering Colleges Report 10% of Faculty Positions Vacant in Fall 1980." NSF 81-322; November 2, 1981.
- "Projected Employment Scenarios Show Possible Shortages in Some Engineering and Computer Specialties." NSF 83-307; February 23, 1983.

SEMINARS IN INNOVATION PRODUCTIVITY

Question: On January 24, 1983, you announced another seminar in your series on innovation and productivity. Could you please describe the major conclusions and findings of this study which was designed to identify strategies proving successful in 110 U.S. factories throughout the past decade in comparison with factories in Japan?

Answer: First, it must be noted that this research project is still in process and, thus, the major conclusions and findings to date are preliminary. The researchers are finishing up their study of U.S. firms and were only recently funded to extend that study to Japan. The results to date are from a comparison of the 110 U.S. firms with an earlier study of 94 Japanese firms by Dr. Koya Azumi. The Japanese sample will be supplemented to match the U. S. firms.

With this qualification, the major findings to date are as follows:

- Survival rates and productivity growth were higher in Japanese than in U.S. factories during the 1970's.
- Japanese firms have tended to emphasize investment in both human and capital resources, while U.S. companies have tended (until recently) to emphasize capital resources.
- Factories in the U.S. which have a "flat" organizational structure (i.e., short chains of command, relative free communication) are relatively more innovative than those having a "tall," hierarchical organizational structure. This finding is replicated in Japanese sites but the relationship is not as strong.
- Flat organizational structures are associated also with high productivity in the U.S. These relationships were not found in the Japanese companies.
- High technology markets require products of both high quality and low price. U.S. firms whose products have one of these characteristics but not the other are at a competitive disadvantage relative to Japanese firms.
- Innovation is positively related to productivity in both the U.S. and Japan.
- There is growing evidence of a "high technology convergence," even though U.S. and Japanese firms have previously specialized to some extent in different markets, have employed different organizational strategies and utilize different performance measures.

To expand briefly on this last point, in the high technology arena U.S. firms are becoming more like Japanese firms and vice versa. U.S. firms are placing more emphasis on product quality and productivity and developing flatter organizational structures. For Japan, development of new products is becoming more important, with an increased emphasis on a formal R&D function and specialization of professionals. (As a word of caution, however, it should be noted that the sample of high performing U.S. firms is relatively small.)

Senator Garn—Continued

MATERIAL HANDLING RESEARCH CENTER

Question: In February you announced the establishment of a Material Handling Research Center at the Georgia Institute of Technology in Atlanta. The aim of this center is to increase the productivity in handling, storage, and control of materials. Could you please describe the selection process that was used to identify the Georgia Institute of Technology as the host institution for this Center? What was the specific rationale for establishing a Material Handling Research Center? What specific goals or objectives will the Center have?

Answer: The Georgia Institute of Technology Industry/University Cooperative Research Center for Material Handling was selected for support in response to an unsolicited proposal. The proposal was submitted in accordance with the Program description in NSF's Guide to Programs. I met the following criteria that NSF has established as crucial to the success of an Industry/University Cooperative Research Center.

1) The university/industry interface was well developed organizationally and technically.

2) There was significant industrial support already in place.

3) Georgia Tech has a history of good research in material handling.

4) The research portfolio was consistent with NSF's interests in supporting high quality research.

As Georgia Tech demonstrated in their proposal, there is a significant national need for a Material Handling Research Center. While there appears to be growing concern and research on manufacturing technologies, materials handling research is negligible. Contacts with industry by Georgia Tech and subsequently by NSF confirmed this view.

The goals and objectives of the Center for Material Handling are:

1) to conduct an industrially relevant research program initially addressing research on material handling in manufacturing systems, warehouse systems, logistic systems, and automation and sensing;

2) develop a strong industry/university interaction with member companies, and add new companies to the membership role to increase the industrial support base of the research program;

3) to develop the technical capability of U.S. manufacturing in material handling.

Question: Could you please describe the expected funding sources and the amount of funding for the Center in its first 5 years?

Answer: The estimated funds and funding sources for the first 5 years of the Center are as follows:

DOLLARS IN THOUSANDS

	Industry Membership	Georgia Tech Cost Sharing	NSF
1983	$ 600	$200	$ 200
1984	660	200	200
1985	720	200	150
1986	780	200	100
1987	840	200	50

In addition to its membership in the Center, Litton Unit Handling System of Florence Kentucky, is awarding $600,000 to equip the Material Handling Laboratory that the Center will use for research.

SCIENCE EDUCATION

Question: In describing your Science Education and Education Program, your budget justification states, "The NSF role is to address the long term development of a strong human resource base to meet the needs of science and technology through: the graduate research fellowships; leadership and identifying areas of special concern; and selected high leverage activities where significant improvement is possible with limited investments".

Question: Given this stated orientation, how would you differentiate the role of NSF from that of the Department of Education?

Answer: The National Science Foundation focuses on science and works mainly through scientists and engineers in academic and professional organizations. Moreover, NSF awards are based on competitive peer review.

In contrast, the Department of Education addresses education more broadly, and works through state and local school systems and schools of education in colleges and universities. The Department's focus has been on equal educational opportunity and it makes predominant use of formula grants to states and local education agencies, rather than competitive grants.

Question: Do you expect the National Science Board's Commission on Precollege Education and Mathematics, Science and Technology to address the issue of the relative roles of the various Federal agencies in science and math education?

Answer: The Commission certainly will address the matter of Federal responsibilities and can be expected to address agency roles in a general way. However, the Commission believes it is inappropriate to appear to be directive, so it is not likely to get into details about relative roles of Federal agencies.

Question: Your budget justification suggests that the Foundation will undertake a program during FY 1983 providing teacher training for approximately 10,000 secondary school teachers of mathematics and science. On the basis of my February 17 letter to you and your recent reply, how would you now describe your science education program for FY 1983?

Answer: The present plan reduces the apparent emphasis of the earlier plan on training activities, as such, and increases the emphasis on the development of models and materials for the continuing education of mathematics and science teachers. I strongly believe that it is still important to get bench scientists in contact with school teachers to work together on problems of school science and mathematics education. Thus, I see the changes as a shift in strategy rather than of basic purpose.

Question: On the basis of your revisions to the FY 1983 program, how would you characterize the efforts you intend to undertake during FY 1984 if the Congress made the $20 million requested in your budget?

Answer: The FY 1984 efforts will continue and extend those begun in FY 1983. Meanwhile, we will be looking closely to see what modifications might be suggested by the Commission's report when it is available toward the end of the year.

FELLOWSHIPS

Question: This year you are requesting $19 million for NSF Fellowships. $4 million of this amount will be used to raise the stipend and cost-of-education allowance for the Graduate Fellows. The stipends will increase $1,200 from $6,900 to $8,100 while the cost-of-education allowance will be increased by $900 from $4,000 to $4,900.

How do these proposed stipends and cost-of-education allowances compare to other fellowship programs such as DOD and ONR?

Answer: The DOD and ONR Fellowships for FY 1983 carry base stipends of $12,500 and pay full tuition plus $2,000 to the Department. Thus the NSF Fellowship stipends and cost-of-education allowances are still below the DOD and ONR levels.

Question: How many Graduate Students will you be able to support during FY 1984 if the $19 million is approved?

Answer: In FY 1984 the Foundation will be able to support approximately the same number of Graduate Fellows as were supported in FY 1983 - approximately 1,390 - if the $19 million is approved. The increase of $4 million will cover the cost of the increased stipend and cost-of-education allowances for the approximately 1,390 Graduate Fellows.

Question: How many first year fellowships would you be able to initiate during 1984 and how would this relate to the 1983 level?

Answer: The Foundation will offer approximately 500 new fellowships in FY 1984, the same number offered in FY 1983.

Question: How many individuals do you expect will apply for NSF Fellowships during FY 1984?

Answer: The Foundation anticipates approximately 4,500 applications for the FY 1984 Graduate Research Fellowship competitiion.

SUPPLY OF SCIENCE TEACHERS

On February 18, 1983, an article appeared in Science concerning the supply of science teachers. Two basic issues were raised in this article. One is that students majoring in education have weaker academic skills than students majoring in most other fields. And secondly, students are becoming more concerned with the financial rewards associated with their career and consequently less interested in pursuing any teaching.

Question: How serious do you consider both of these issues?

Answer: Both these phenomema have serious implications for the Nation. However, changing them will require a substantial national commitment to excellence in education. This commitment must engage state and local government and the private sector, as well as the Federal government. Moreover, parents must attach importance to quality education and support it in the home.

At the same time, it is important to recognize that the status of teachers and teaching conditions are important factors, as well as salary. Improving student motivation and the non-monetary rewards of a teaching career are also needed.

Question: To what extent can an approach that is just geared toward increasing the skills of existing teachers be successful without addressing the societal issues of salaries?

Answer: Certainly, increasing the skills of existing teachers is important, but only part of the problem. Over the long run, it will be essential to foster a steady flow of talented young people into teaching careers and this will require that serious attention be given to the comparative salaries of teachers. Meanwhile, we should not overlook the need to do what we can in the near term by upgrading the skills of those already teaching.

Senator Garn—Continued

USE OF COMPUTERS IN SCIENCE EDUCATION

Question: On October 5, NSF announced a pioneering program involving the donation of equipment by private industry aimed at improving science and engineering education at the tenth, eleventh, and twelfth grade, and early college levels through the use of computers and other information handling equipment. A number of companies had committed to provide computers and related hardware technical information about the equipment and expert assistance so that the computer could be used to the best advantage in the project. At the time, NSF expected to make available $855,668 for research under the program. Could you please describe the objectives of this program?

Answer: The objective of the NSF-Industry Cooperation for Science and Engineering Education Using Computers program was to explore the uses of computing in science and engineering instruction through support for prototype computer-related development activities. Also, the Foundation wanted to test an approach to cooperation between the Federal and private sector.

Question: Could you describe how the 58 project teams were selected?

Answer: Projects were selected by panels of peer reviewers who read the proposals and evaluated them according to the following review criteria: quality and rationale of the proposal; appropriateness of the project design and evaluation; the project's potential for improving science and engineering education and personnel; and the institutional resources and budget for the project.

Question: Could you describe the status of the program and how it might be integrated into your FY 1983 and FY 1984 science program?

Answer: The grants were made in September 1982 and all projects have received their equipment and seem to be progressing well. Grantees have been uniformly complimentary about industry participation and performance.

Industry contributions will be urged and encouraged in the 1983 and 1984 NSF programs. We expect that many proposals will focus on computing in precollege mathematics and science, and that companies may be willing to donate equipment to some of these projects.

Question: What specific evaluation does NSF intend to undertake in order to determine the effectiveness of the projects in improving the knowledge of pre-college science and engineering students?

Answer: We will be exploring, during the coming year, various plans, mechanisms, and approaches for third party evaluations of outcomes and impacts of these projects.

AVAILABILITY OF FUNDS FOR SCIENCE AND ENGINEERING EDUCATION ACTIVITIES

Question: Your appropriations language for Science and Engineering Education for FY 1984 requests that the appropriated funds be made available for two fiscal years -- FY 1984 through FY 1985. The FY 1983 appropriations bill extended the availability of FY 1983 funds through FY 1984, so that the Foundation would have an opportunity to prepare a program plan and the Congress would have an opportunity to review such a plan.

Now that that plan is prepared, why do you feel that it is necessary to have two-year money for this activity?

Answer: Since the Science and Engineering Education Program was not approved until April 15, 1983, the time needed to advertise the program in the academic community, allow for proposal preparation, receipt and review by NSF, and grant award processing is approximately 6 months. Because of the complexity of the new program and lack of staff resources, the Foundation wants to assure that it has the requisite flexibility to allow enough time for proposal preparation and review.

The problems of precollege science and mathematics have not developed within the past year nor can they be resolved within one or two years. A thoughtful, structured approach is essential to insure that not only are funds wisely obligated but that there will be a significant product realized from these grants. NSF should be appropriated the FY 1984 Science and Engineering Education funds for a two-year period. It would also be appropriate to continue the two-year money through FY 1985 in anticipation of additional new directions that might become necessary as a result of the FY 1983 and FY 1984 program experience or the report of the NSF Commission on Precollege Education in Mathematics, Science and Technology. This general philosophy puts science education on the same basis as the research and related activities to assure that the highest quality ideas are supported.

Question: What would be the effect of making the FY 1984 appropriated funds available only through the end of that fiscal year?

Answer: Due to the time requirements, program complexity, and limitations on staff resources mentioned earlier, there is a chance that not all funds would be expended.

Question: How much of the $15 million provided in FY 1983 do you expect to obligate by September 30, 1983?

Answer: It is not possible to predict precisely, but it is not likely to exceed $5 million, due to intense shortness of time between the Science and Engineering Education program plan (April 15, 1983) and the end of the fiscal year, and limitations on staff resources.

PROGRAM DEVELOPMENT AND MANAGEMENT - PERSONNEL LEVELS

During FY 1984, you expect the number of full-time equivalent staff for the Foundation to be reduced from 1,218 in FY 1983 to 1,194 in FY 1984.

Question: What areas do you intend to take this reduction of 24 FTE?

Answer: It is anticipated that the reduction of 24 FTE will be as follows:

Scientific, Technological and International Affairs	11
Executive Management	9
Central Support and Administration	4
TOTAL	24

COMPARISON OF PLANNED EQUIPMENT PURCHASES

Question: Last year, you included a table in the record comparing your planned equipment purchases for FY 1982 and FY 1983.

Could you please update this table to include the FY 1984 figures?

Answer: Planned equipment purchases for FY 1984 compared to the FY 1983 Current Plan estimates are as follows:

Type of Equipment	Current Plan FY 1983	Estimate FY 1984	Difference FY 1984/83
Data Processing Equipment	$625,000	$625,000	-0-
Mini computer and peripheral hardware	(70,000)	(100,000)	$(30,000)
Expansion of system and workstations	(400,000)	(400,000)	(-0-)
Communication equipment	(155,000)	(125,000)	(-30,000)
Administrative Services Equipment	300,000	300,000	-0-
Office equipment	(240,000)	(240,000)	(-0-)
Reference books for the permanent collection	(55,000)	(55,000)	(-0-)
Health services equipment	(5,000)	(5,000)	(-0-)

ASSUMPTION OF RESPONSIBILITY

Question: Please prepare for the record, a list of all activities expected to be transferred to NSF during FY 1984 and the cost associated with assuming the responsibility for these activities.

Also prepare a list of these activities and the associated FY 1984 costs that will be transferred out of NSF.

Answer: No activities from other agencies are to be transferred during FY 1984 to NSF. Also, no activities are planned to be transferred out of NSF during FY 1984.

TRAVEL FOR REVIEW PANELS

Last year, I asked you how your planned reduction of $100,000 in travel for your proposal reviewers, panels and advisors during FY 1983 might affect the quality of your review process. You responded that, "Program oversight and the quality of the review process will be somewhat affected by this reduction, but this will be offset by a greater reliance on mail reviewers and by holding proposal review meetings of longer duration. It is not expected that the reduction will drastically affect the quality of the review process."

Question: How much are you requesting in FY 1984 for reviewer, panelist and adviser travel?

Answer: $1,157,000 including travel for the National Science Board.

Question: How does this relate to the FY 1983 level?

Answer: The FY 1984 request is the same level as FY 1983.

FUNDS FOR NSB COMMISSION ON PRE-COLLEGE EDUCATION

Your FY 1982 budget contained $293,672 for the work of the Commission on Pre-College Education. Since then, the Foundation has not requested any additional funds for the Commission.

Question: Could you please provide for the record an object class description of the cost incurred by the Commission in FY 1982 and the estimated cost for FY 1983?

Answer: Please see attached table on costs by object class.

Question: Do you believe that the Commission will be able to satisfactorily complete its work during FY 1983 with the resources remaining available to it?

Answer: It is expected that the Commission will complete its work during FY 1983. It plans to issue its report early in the fall. As stated in the FY 1983 Budget Justification, funds required by the Commission in FY 1983 are being provided from other available NSF resources. If any funding is required in FY 1984, it will be small, such as printing costs, and will be provided from other resources.

The Commission recently met in Houston, visited local schools, and discussed proposals at a public forum with a variety of concerned citizens. School teachers and administrators, university science and education faculty, representatives of professional associations, private industry, and science museums were among those who took part. The Commission considered this exchange to a most valuable experience.

NATIONAL SCIENCE BOARD COMMISSION ON PRECOLLEGE EDUCATION
COST BY OBJECT CLASS
FY 1982 - FY 1983

	FY 1982 Actual	FY 1983 Estimate
Program funds:		
Contractual Services:		
Science and Engineering Education Appropriation	$ 293,672	-0-
Research and Related Activities Appropriation	25,000	$ 350,000
Subtotal, Program Funds	318,672	350,000
Program Development & Management Funds		
Contractual Services	-0-	35,000
Staff Travel	3,778	35,000
Commission Members Travel	-0-	94,000
Commission Members Compensation	-0-	103,000
Subtotal, PD&M Funds	3,778	267,000
TOTAL	$ 322,450	$ 617,000

PROGRAM DEVELOPMENT AND MANAGEMENT

On Page NSF-6 of your budget justification, you state that the unobligated balances of $331,404 from the FY 1982 Research and Related appropriations account will be used to partially offset a shortage in personnel, compensation and benefits. The shortage resulted from the $700,000 reduction in Program Development and Management contained in the FY 1983 HUD-Independent Agencies Appropriations Act.

Senator Garn—Continued

Question: When did you expect a reprogramming for the use of these carryover funds?

Answer: The $331,404 unobligated balance of the FY 1982 Program Development and Management limitation is available for obligation, as part of the FY 1982 appropriation, until September 30, 1983. It has been the Foundation's practice since FY 1975, the first year that the annual appropriation act specified a two-year availability for the Research and Related Activities appropriation, to make available for obligations in the year after the original appropriations, such Program Development and Management unobligated balances and carryovers as are available and are needed. This is consistent with: (a) the funds being appropriated specifically for Program Development and Management expenses; and (b) the funds being available for a two-year period.

Question: Did you notify the committees on your intent to partially restore the reductions made in the Appropriations Act?

Answer: Since the $331,404 is being made available for the purpose for which they were originally appropriated, the question of reprogramming does not arise and the Foundation considers that the committees are notified by clearly presenting its planned use of the funds in the Budget Justification document.

Question: Will this restoration result in the Foundation exceeding the $62,381,000 specified in the Act for program development and management.

Answer: The specific limitation of $62,381,000 refers only to the FY 1983 Program Development and Management estimate funded from the FY 1983 Research and Related Activities appropriation.

CARRYOVER BALANCES

In FY 1982, you had carryover balances of $2.3 million from prior years. In FY 1983, you expect a carryover balance of $3.3 million from prior years. Your FY 1984 budget plan does not indicate any carryover.

Question: Based on your most current estimates, do you now anticipate a carryover?

Answer: In developing estimates for the budget year, the Foundation anticipates that the total estimate will be obligated prior to the end of that fiscal year. In actual practice it is impossible to obligate the entire appropriation due to the internal allocation process, the necessity to have funds available for last minute obligations and because, particularly in the Program Management and Development Activity, all valid obligations are not identified until after the close of the fiscal year and to meet them a small contingency fund must be maintained.

Senator Garn--Continued

The internal allocation process distributes funds to nearly 200 program accounts and an additional 250 Program Development and Management accounts. If only an average of $2,000 remains in each account, far less than the average award amount, the aggregate amount would be nearly $1 million. It is neither practical or feasible to spend each one of these accounts down to zero and as a result there remains an unobligated balance of two-tenths to three-tenths of one percent of the total funds available each year. Another way of stating this is that the Foundation obligates 99.7 percent to 99.8 percent of the funds available in the year of appropriation.

Additionally, the Foundation over the past two years has taken advantage of the flexibility available within the two-year appropriation authority to delay final obligation of approved awards in order to establish a contingency fund in the event that there is neither an approved appropriation nor a continuing resolution in place at the beginning of the fiscal year. Upon passage of appropriation authority, these obligations were immediately made for the awards approved in the previous fiscal year.

The FY 1984 unobligated balance will probably be within this two-tenths to three-tenths range.

Question: Due to the slow start in science and engineering education, what level of carryover do you expect in this program area?

Answer: It is not possible to predict precisely, but it is likely to exceed $10 million.

OMB REQUEST

Please submit for the record a table containing your initial request to OMB for FY 1984 and the levels contained in your FY 1984 budget request. Please use the same level of detail as appears on Page NSF-41 through NSF-49 of your budget justification.

Answer: A table comparing the FY 1984 budget request to the Office of Management and Budget and the FY 1984 Budget Request to Congress is attached.

COMPARISON OF FY 1984 BUDGET REQUEST TO OMB
AND
FY 1984 BUDGET REQUEST TO CONGRESS

(Dollars in Millions)

05/09/83

Activity	Request to OMB	Request to Congress
RESEARCH AND RELATED ACTIVITIES		
Mathematical and Physical Sciences..................	$325.50	$364.30
Engineering..	111.30	123.00
Biological, Behavioral, & Social Sciences...........	203.10	223.60
Astronomical, Atmospheric, Earth and Ocean Sciences.	321.50	334.90
U.S. Antarctic Program..............................	91.30	102.10
Scientific, Technological, and International Affairs	51.70	36.80
Program Development and Management..................	65.50	66.00
Subtotal, Research and Related Activities........	1,169.90	1,250.70
SCIENCE AND ENGINEERING EDUCATION...................	21.00	39.00
SPECIAL FOREIGN CURRENCY PROGRAM....................	2.60	2.60
TOTAL, NSF APPROPRIATIONS...............	$1,193.50	$1,292.30

Activity	Request to OMB	Request to Congress
Materials Research:		
Solid State Physics.............................	$9.80	$10.80
Solid State Chemistry...........................	7.30	8.00
Low Temperature Physics.........................	6.70	7.40
Condensed Matter Theory.........................	7.20	8.00
Metallurgy......................................	8.60	9.50
Ceramics..	4.80	5.40
Polymers..	6.20	6.60
Instrumentation for Materials Research..........	4.20	7.80
Materials Research Laboratories.................	25.30	27.75
National Magnet Laboratory......................	5.00	5.10
Synchrotron Radiation...........................	2.40	2.60
Small Angle Scattering..........................	.60	.60
Subtotal, Materials Research.................	88.10	99.55
Subtotal, Mathematical and Physical Sciences.	325.50	364.30
Engineering		
Electrical, Computer, & Systems Engineering (ECSE):		
Automation, Bioengineering, and Sensing Systems..	5.70	6.35
Electrical and Optical Communications............	5.90	6.35
Computer Engineering.............................	3.10	3.70
Quantum Electronics, Waves and Beams.............	5.10	5.40
Solid State and Microstructures Engineering......	6.60	7.20
Systems Theory and Operations Research...........	5.20	5.40
Science and Technology to Aid the Handicapped....	.00	2.30
Subtotal, ECSE...............................	31.60	36.70

Activity	Request to OMB	Request to Congress
Chemical and Process Engineering (CPE):		
Kinetics, Catalysis and Reaction Engineering	4.00	4.49
Chemical and Biochemical Processes	5.20	5.80
Engineering Energetics	3.50	3.80
Thermodynamics and Transport Pheaomena	3.80	4.24
Particulate and Multiphase Processes	3.60	3.95
Separation Processes	2.00	2.33
Minerals and Primary Materials Processing	2.30	2.49
Subtotal, CPE	24.40	27.10
Civil and Environmental Engineering (CEE):		
Geotechnical Engineering	3.40	4.00
Structural Mechanics	3.00	3.70
Hydraulics, Hydrology, and Water Resources Engrg.	4.40	4.40
Environmental and Water Quality Engineering	3.40	3.30
Earthquake Hazard Mitigation:		
Siting	8.10	8.10
Design	8.60	8.60
Societal Response	2.30	2.30
Subtotal, Earthquake Hazard Mitigation	19.00	19.00
Subtotal, CEE	33.20	34.40
Mechanical Engineering and Applied Mechanics (MEAM):		
Fluid Mechanics	5.00	$5.40
Heat Transfer	4.50	5.70
Solid Mechanics	4.30	4.70
Mechanical Systems	3.90	4.45
Production Research	4.00	4.55
Subtotal, MEAM	21.70	24.80
Interdisciplinary Research	.40	1/ .00
Subtotal, Engineering	111.30	123.00
Biological, Behavioral, and Social Sciences		
Physiology, Cellular, and Molecular Biology (PCM):		
Molecular and Genetic Biosciences 2/		
Biochemistry		12.92
Biophysics		12.43
Genetic Biology		15.08
Metabolic Biology		14.13
Alternative Biological Sources		2.35
Subtotal	49.20	56.91
Cellular and Physiological Biosciences 2/		
Cell Biology		10.28
Cellular Physiology		7.44
Developmental Biology		12.68
Regulatory Biology		8.90
Subtotal	34.30	39.30
Biological Instrumentation	6.00	6.49
Subtotal, PCM	89.50	102.70
Biotic Systems and Resources(BSR):		
Ecological Science 2/		
Ecology		8.06
Ecosystem Studies		16.86
Subtotal	23.50	24.92
Systematic and Population Biology 2/		
Systematic Biology		11.04
Population Biology and Physiological Ecology		8.84
Biological Research Resources		8.80
Subtotal	22.70	28.68
Subtotal, BSR	46.20	53.60

Activity	Request to OMB	Request to Congress
Behavioral and Neural Sciences (BNS):		
Neuroscience 2/		
Neurobiology		13.00
Sensory Physiology and Perception		7.60
Psychobiology		3.80
Subtotal	22.10	24.40
Cognitive Science 2/		
Memory and Cognitive Processes		2.60
Social and Developmental Psychology		2.20
Linguistics		2.40
Subtotal	7.30	7.20
Anthropology	6.30	6.30
Subtotal, BNS	35.70	37.90
Social and Economic Sciences (SES):		
Economics and Geography 2/		
Economics		9.10
Geography		1.00
Subtotal	10.20	10.10
Social Measurement and Analysis 2/		
Sociology		2.80
Measurement Methods and Data Resources		3.50
History and Philosophy of Science		1.20
Subtotal	9.10	7.50
Political and Policy Science 2/		
Political Science		2.60
Law and Social Sciences		1.25
Regulation and Policy Analysis		.90
Decision and Management Science		.95
Subtotal	6.40	5.70
Subtotal, SES	25.70	23.30
Information Science and Technology (IST):		
Information Science	4.10	4.00
Information Technology	.90	1.00
Information Impact	1.00	1.10
Subtotal, IST	6.00	6.10
Subtotal, Biological, Behavioral, & Soc. Sci.	203.10	223.60
Astronomical, Atmospheric, Earth and Ocean Sciences		
Astronomical Sciences:		
Astronomy Project Support 2/		
Solar System Astronomy		2.20
Stars and Stellar Evolution		5.46
Stellar Systems and Motion		1.59
Galactic and Extragalactic Astronomy		8.84
Astronomical Instrumentation and Development		9.80
Electro-Magnetic Spectrum Management		.11
Subtotal	22.60	28.00
National Astronomy and Ionosphere Center (NAIC) 2/		
Scientific Research Support		6.52
Construction		.0
Less NASA Support		-.32
Subtotal	6.30	6.20
Kitt Peak and Cerro-Tololo Inter-American Observatories (KPNO/CTIO) 2/		
Scientific Research Support		21.57
Management Fee		.33
Subtotal	19.80	21.90
National Radio Astronomy Observatory (NRAO) 2/		
Scientific Research Support		20.27
Management Fee		.33
Subtotal	17.10	20.60

Activity	Request to OMB	Request to Congress
Sacramento Peak Observatory 2/		
Scientific Research Support		$2.97
Management Fee		.05
Less DOD Support		-.42
Subtotal	2.40	2.60
Subtotal, Astronomical Sciences	68.20	79.30
Atmospheric Sciences:		
Atmospheric Project Support 2/		
Aeronomy		9.80
Atmospheric Chemistry		6.90
Climate Dynamics		7.40
Experimental Meteorology		5.40
Global Atmospheric Research Program (GARP)		4.80
Meteorology		8.50
Solar Terrestrial Research		7.20
Subtotal	43.70	50.00
National Center for Atmospheric Research (NCAR) 2/		
Atmospheric Analysis and Prediction		3.55
Atmospheric Chemistry and Aeronomy		2.73
Convective Storms		2.34
Advanced Study Program		1.37
High Altitude Observation		3.62
Atmospheric Technology		7.51
Scientific Computing		10.38
Administration and Support Services		4.84
Physical Plant Operation and Maintenance		3.36
Contractor Fee		.90
Subtotal, NCAR	36.00	40.60
National Scientific Balloon Facility	.00	.00
Subtotal, Atmospheric Sciences	79.70	90.60
Earth Sciences:		
Stratigraphy and Paleontology	5.20	4.80
Environmental Geosciences	3.30	2.90
Crustal Structure and Tectonics	5.20	5.90
Seismology and Deep Earth Structure	7.00	6.40
Experimental and Theoretical Geophysics	5.20	5.70
Petrogenesis and Mineral Resources	3.90	5.20
Mantle Geochemistry	4.00	4.00
Experimental and Theoretical Geochemistry	5.90	7.20
Subtotal, Earth Sciences	39.70	42.10
Ocean Sciences:		
Ocean Science Research 2/		
Physical Oceanography		15.60
Marine Chemistry		12.30
Submarine Geology and Geophysics		14.90
Biological Oceanography		12.90
Subtotal	55.60	55.70
Oceanographic Facilities and Support 2/		
Operations		25.90
Ocean Technology Program		7.50
Subtotal	32.60	33.40
Subtotal, Ocean Sciences	88.20	89.10
Ocean Drilling Programs: 2/		
Ocean Drilling Programs		$29.50
Less Foreign Funding		-1.20
Less Other U.S. Agencies' Funds		-2.00
Subtotal, Ocean Drilling Program	38.40	26.30

Activity	Request to OMB	Request to Congress
Arctic Research Program:		
Atmospheric Sciences	1.00	1.00
Biological Sciences	1.80	2.00
Earth Sciences	1.10	1.10
Glaciology	2.00	2.00
Oceanography	1.20	1.23
Information and Advisory Services	.20	.17
Subtotal, Arctic Research Program	7.30	7.50
Subtotal, Astronomical, Atmospheric, Earth and Ocean Sciences	321.50	334.90
U.S. Antarctic Program		
U.S. Antarctic Research Program:		
Atmospheric Sciences	2.10	2.10
Biological Sciences	2.40	2.40
Earth Sciences	1.70	1.70
Glaciology	1.60	1.60
Oceanography	1.50	1.55
Information and Advisory Services	.70	.65
Subtotal	10.00	10.00
Operations and Support Program:		
Direct Science Support	10.90	12.10
Base Level Support	58.40	60.40
Major Construction and Procurement	12.00	19.60
Subtotal	81.30	92.10
Subtotal, U.S. Antarctic Program	91.30	102.10
Scientific, Technological, and International Affairs		
Industrial Science and Technological Innovation:		
Industry/University Cooperative Research Projects	7.00	7.00
Small Business Innovation Programs	5.50	5.50
Industry/University Cooperative Research Centers.	3.00	3.00
Productivity Improvement Research	1.00	1.00
Subtotal	16.50	16.50
International Cooperative Scientific Activities:		
International Cooperative Science	9.80	3.90
International Science Organizations and Resources	1.10	1.10
Subtotal	10.90	3/ 5.00
Policy Research and Analysis:		
Socioeconomic Effects of Science and Technology	1.80	1.75
Technology Assessment and Risk Analysis	1.80	1.85
Advanced Technologies and Resources Policy	1.00	1.00
Ethics and Values in Science and Technology	1.00	4/ (1.00)
Subtotal	5.60	4.60
Science Resources Studies:		
Science and Technology Pesonnel	2.10	2.10
Funding of Science and Technology	1.30	1.30
Advanced Technologies and Resources Policy	.80	.80
Subtotal	4.20	4.20
Intergovernmental & Public Service Science & Tech.	.50	5/ .00

Activity	Request to OMB	Request to Congress
Research Initiation and Improvement:		
Presidential Young Investigators Research Awards.		6/ (6.00)
Undergraduate College Research Support...........		6/ (3.00)
Two- & Four-Year College Research Instrumentation	2.00	.00
Visiting Professorships for Women................	1.00	1.00
Research Opportunity Grants for Women............	1.00	
Minority Research Initiation.....................	2.50	2.00
Research Improvement in Minority Institutions....	2.50	2.00
Experimental Program to Stimulate Competitive Res	2.50	6/ (2.50)
Intergovernmental Science and Technology.........	(.50)	.50
Ethics and Values in Science and Technology......	(1.00)	1.00
NSF Planning and Evaluation......................	2.50	6/ (2.50)
Alan T. Waterman Award...........................	.00	6/ (.15)
Subtotal..................................	14.00	6.50
Subtotal, Scientific, Technological, and International Affairs......................	51.70	36.80
Program Development and Management.................	65.50	66.00
SUBTOTAL, RESEARCH AND RELATED ACTIVITIES....	1,169.90	1,250.70
SCIENCE AND ENGINEERING EDUCATION		
Graduate Research Fellowships.....................	21.00	19.00
Precollege Teacher Improvement in Science & Math...	.00	20.00
SUBTOTAL, SCIENCE AND ENGINEERING EDUCATION..	21.00	39.00
SPECIAL FOREIGN CURRENCY PROGRAM		
Research and Related Activities..................	2.60	2.60
TOTAL, NSF APPROPRIATIONS..............	$1,193.50	$1,292.30

1/ Funds for Interdisciplinary Research merged with other Engineering programs.
2/ OMB request not broken out below this level.
3/ NSF total for International Coop. Science Activities is $10.9 million, including $5.9 million under major disciplinary research activities.
4/ Included under Research Initiation and Improvement in request to Congress.
5/ Included under Research Initiation and Improvement in request to Congress.
6/ Funding will be provided through the disciplinary research activities.

PROGRAM DEVELOPMENT & MANAGEMENT GRANT REDUCTIONS.

Question: On Page PDM-4 of your budget justification, you note that a variety of program development and management activities have been reduced from their originally contemplated FY 1983 level by $1,946,000 in order to absorb the $700,000 reduction made by Congress and to fund additional personnel compensation costs. One of the activities that has been proposed for reduction is "grants".

Could you please describe the specific grants that will not be conducted, or that have been reduced in scope, from the original FY 1983 request level?

Answer: The specific grants included in the Program Development and Management category: Grants, Subsidies and Contributions, are made to spouses or other family members of recipients of the National Medal of Science, the Alan T. Waterman Award and the Vannnevar Bush award to cover their expenses in connection with attending the presentation ceremonies in Washington, D.C.

The actual expenses covered by these grants vary from year to year depending on a number of factors including: whether Medals of Science are awarded in a particular year, the number of medals awarded a year and the specific expenses incurred by the recipients' spouses. The $55,000 included in the original FY 1983 request was a contingency which was intended to be sufficient to cover maximum costs. The more current estimate included in the FY 1983 Current Plan is considered adequate to cover the potential expenses for awardees' spouses for awards planned to be made in FY 1983.

PROPOSAL AND RESEARCH DATA SUMMARY

Question: Page QDT-2 of your budget justification contains summary data on your proposal activity, research funding and science and education activities.

Could you please correct the second centerheading in that table to read "Science and Engineering Education Activities" and include the table for the record?

Answer: The table is attached.

Quantitative Data Table: Summary

	Actual FY 1982	*Estimate FY 1983*	*Estimate FY 1984*
Proposal Summary			
Number of Proposals Received	27,621	31,181	33,522
Dollars Requested (Total)	$3,654,293,986	$4,216,558,000	$4,817,650,000
Action Summary			
Number of Awards	13,025	13,203	13,348
Dollars Obligated (Total)	999,141,655	1,097,165,396	1,292,300,000
Dollar Distribution of Funds by Performer			
Universities	733,696,444	807,554,403	965,175,780
Industry	27,599,888	30,102,972	36,041,520
Federal Agencies	58,836,387	69,836,104	80,895,460
Other	179,008,936	189,671,917	210,187,240
Research Activities			
Senior Scientists:			
Number of Scientists Supported	12,697	12,793	13,183
Amount of Scientist Support	126,146,245	135,450,340	149,112,000
Number of Years of Scientist Support	3,481	3,547	3,753
Postdoctoral Support:			
Number of Postdoctorals Supported	2,913	2,957	3,189
Amount Postdoctoral Support	43,048,681	46,418,870	54,921,400
Graduate Students:			
Number of Graduate Students Supported	9,341	9,631	10,428
Amount Graduate Student Support	72,221,341	79,777,540	92,578,200
Other Personnel Costs:			
Amount of Support	144,631,126	149,834,529	165,863,000
R&D Facilities, Equipment, and Instrumentation:			
Land, Buildings, Fixed Equipment	1,500,000	2,450,000	8,000,000
Large Scale Equipment	9,386,421	16,900,000	23,800,000
Other Equipment and Instrumentation	80,564,117	95,309,237	156,360,900
Other Direct Research Costs:*	254,774,280	273,933,698	311,684,900
Indirect Costs:	245,972,208	267,091,182	290,979,600
Subtotal	$978,244,419	$1,067,165,396	$1,253,300,000
Science and Engineering Education Activities			
Personnel and Other Award Factors			
Professional Staff Costs	$1,049,750	$6,369,340	$8,535,550
Other Staff Costs	547,282	1,318,200	1,759,430
Subtotal, Staff Costs	1,597,032	7,687,540	10,294,980
Expendable Supplies & Equipment	419,435	511,820	749,860
Permanent Equipment	287,824	—0—	—0—
Other Project Direct Costs	1,327,728	773,680	995,770
Subtotal, Nonstaff Project Costs	2,034,987	1,285,500	1,745,630
Total, Direct Costs	3,632,019	8,973,040	12,040,610
Indirect Costs	1,064,660	3,920,960	5,459,390
Participant Support Costs:			
Stipend & Other Personal Allowances	10,270,792	11,746,000	14,640,000
Cost-of-Education Allowances	5,929,765	5,360,000	6,860,000
Total, Participant Support Costs	16,200,557	17,106,000	21,500,000
Subtotal	$20,897,236	$30,000,000	$39,000,000
TOTAL	$999,141,655	$1,097,165,396	$1,292,300,000

* Includes: Supplies, Publications, Consultants, Computer Subcontracts, Travel.

PROGRAM DEVELOPMENT & MANAGEMENT PERSONNEL REDUCTIONS

On Page PDM-13 of your budget justification, you show a decrease of nine FTE's in your Executive Management function. One of the offices in that function is your Office of Audit and Oversight. This is the office that has been conducting most of the post-performance evaluation research for the Congress and has done other viable activities relative to the oversight of NSF's programs.

Question: How many FTE were there in this office during FY 82?

Answer: 24.0 FTE authorized; 23.4 FTE used (less than authorized due to turnover in Audit staff).

Question: How many FTE are there in FY 83 and how many do you anticipate in FY 84?

Answer: FY 83 - 21.8 FTE anticipated; FY 84 - 20 FTE authorized.

Question: For each year, how many of these FTE were associated with the oversight function rather than the audit function?

Answer:	FTE FY 82	FTE FY 83	FTE FY 84
Headquarters & Oversight*	4.0	4.0	4.0
Audit**	14.4	12.8	14.0
Evaluation	5.0	5.0	2.0
	23.4	21.8	20.0

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* Oversight of decisionmaking by program staff.

** Financial and Management Audits.

Question: Would you please review the desirability of making such an extreme reduction in your oversight capability?

Answer: The Foundation has initiated a study which will analyze the benefits and costs of the present evaluation capability, alternative levels of evaluation capabilities and the potential cost to the Foundation of not having an evaluation office.

It is estimated that this study will take approximately 10 weeks from initiation; with an additional week for comments and another week for preparation of the final report.

SUPPORT OF GRADUATE STUDENTS ON RESEARCH PROJECTS

Question: Please provide a copy of the table appearing on Page NSF-25 of your budget justification for the record.

On the third line on Page NSF-25, I believe that the percentage 16.2 should be changed to reflect the numbers contained in the above table to 16.3%.

Senator Garn—Continued

Could you please reprint the sentence with the corrected number in the record at this point?

Answer: The third line on page NSF-25 correctly reflects the numbers in the table which shows a 16.2 percent increase from FY 1983 to FY 1984 in NSF funding for graduate students.

QUESTIONS SUBMITTED BY SENATOR DOMENICI

SCIENCE AND MATHEMATICS EDUCATION

Question: The National Science Board's Commission on Pre-College Science Education is not due to make its final recommendations until late this fiscal year. At the same time, science education legislation is moving rapidly through Congress. It is entirely possible that a law will have been passed before the Commission makes its recommendations. Should that occur, of what use will the Commission's recommendations be? Would it be possible for the Commission to accelerate its schedule?

Answer: The National Science Board Commission on Pre-College Education in Mathematics, Science and Technology was established on April 20, 1982, for an eighteen month period. Its final report and recommendations were thus expected to be ready by October 20, 1983. The recent acceleration of attention at the federal level to problems in pre-college mathematics and science has led the Commission to reconsider this timetable. It now plans to have its report ready at an earlier date and is aiming for Labor Day.

The Commission wishes to emphasize that it sees the problem as one calling for a long term commitment on the part of all levels of government as well as the private sector. It sincerely hopes that the present concern at the federal level will not dissipate with the passage of legislation in this Congress but will continue in concert with grass roots efforts beginning to get underway throughout the Nation. Similarly, it hopes that its recommendations, when they are issued, will have relevance to those continuing efforts as well as to more immediate actions addressing the problem.

To date, the Commission has issued two reports - Today's Problems, Tomorrow's Crises (October 1982) and an Interim Report to the National Science Board (January 1983). Copies of these are attached.

TODAY'S PROBLEMS, TOMORROW'S CRISES

A REPORT OF THE NATIONAL SCIENCE BOARD COMMISSION ON PRECOLLEGE EDUCATION IN MATHEMATICS, SCIENCE AND TECHNOLOGY—OCTOBER 1982

NATIONAL SCIENCE BOARD
NATIONAL SCIENCE FOUNDATION
WASHINGTON, D.C. 20550

NSB COMMISSION ON PRECOLLEGE
EDUCATION IN MATHEMATICS,
SCIENCE AND TECHNOLOGY

WILLIAM T. COLEMAN, JR., CO-CHAIR
CECILY CANNAN SELBY, CO-CHAIR
LEW ALLEN, JR.
VICTORIA BERGIN
GEORGE BURNET, JR.
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JOSEPH E. ROWE
HERBERT A. SIMON
RICHARD S. NICHOLSON, EXEC. DIR.

October 18, 1982

Dr. Lewis M. Branscomb
Chairman
National Science Board
National Science Foundation
Washington, D.C. 20550

Dear Dr. Branscomb:

We are most pleased to transmit to you the first formal report of our Commission, "Today's Problems, Tomorrow's Crises." This report represents the Commission's assessment of the condition of precollege education in mathematics, science and technology in this country.

The problems summarized in our report--if left unresolved--will escalate in the years ahead. Thus, all Americans need to recognize the broad importance of mathematics, science and technology in the education of our youth. We hope, accordingly, that our report will receive wide dissemination.

The seriousness of the current situation underscores the Commission's resolve to develop, during the remainder of its life, an agenda for action for all sectors of society.

Sincerely,

William T. Coleman, Jr.
William T. Coleman, Jr.

Cecily C. Selby
Cecily Cannan Selby

Introduction

Across the United States, there is escalating awareness that our educational systems are facing inordinate difficulties in trying to meet the needs of the Nation in our changing and increasingly technological society. We appear to be raising a generation of Americans, many of whom lack the understanding and the skills necessary to participate fully in the technological world in which they live and work. Improved preparation of all citizens in the fields of mathematics, science, and technology is essential to the development and maintenance of our Nation's economic strength, military security, commitment to the democratic ideal of an informed and participating citizenry, and leadership in mathematics, science and technology.

To meet these ends, our formal and informal education systems must have the commitment and the capacity to achieve three equally important goals:

- to continue to develop and to broaden the pool of students who are well prepared and highly motivated for advanced careers in mathematics, science and engineering;
- to widen the range of high-quality educational offerings in mathematics, science and technology at all grade levels, so that more students would be prepared for and thus have greater options to choose among technically oriented careers and professions; and
- to increase the general mathematics, science and technology literacy of all citizens for life, work and full participation in the society of the future.

The first goal needs little explanation, since maintenance of U.S. scientific and technological capacity requires superbly educated mathematicians, scientists, and engineers. As the total number of 18-year-olds in the population continues to decrease into the 1990's, the percentage of high school graduates entering preprofessional, college-level courses in science and engineering must increase to meet future manpower needs. In addition, to meet the country's needs for excellence, creativity, and innovation in its scientific work, we must develop and utilize the talents of all Americans, including women and minorities (now currently underrepresented in the science and engineering professions).

The critical value of the second goal has become widely recognized during the past few years. The current gap between opportunities for those with and without credentials in mathematics, science and technology will increase dramatically as the technological complexity of U.S. society increases. Industrial leaders have identified the current shortage of trained technicians as a serious barrier to increased productivity. Military commanders echo this concern about their manpower requirements for meeting national security needs. In such professions as law, journalism, and business management, there is also a growing demand for men and women with backgrounds in mathematics, science, and technology. The current and increasing shortage of citizens adequately prepared by their education to take on the tasks needed for the development of our economy, our culture, and our security is rightly called a crisis by leaders in academe, business, and government.

The third goal is rooted in Thomas Jefferson's familiar dictum that an educated citizenry is the only safe repository of democratic values. The life and work of Jefferson and others make clear that a broad understanding of the relationships between science and society was considered by early Americans as integral to the ideal of the Republic. To lead full lives and to participate with confidence in contemporary American society, citizens need an understanding and appreciation of mathematics, science and technology.

This report reviews the status of math, science and technology instruction in our educational systems and explores some of the key problems and challenges facing those systems. The central conclusion to be drawn is that, in the aggregate, the U.S. educational systems currently are not satisfactorily achieving the second and third goals, and they will need assistance, although perhaps to a somewhat lesser extent, to meet the first.

Data from a number of sources have documented declining student achievement in mathematics and science, as indicated by declines in:

- science achievement scores of U.S. 17-year-olds as measured in three national assessments of science (1969, 1973, and 1977);
- mathematics scores of 17-year-olds as measured in two national assessments of mathematics (1973, 1978); the decline was especially severe in the areas of problem-solving and applications of mathematics;
- mathematical and verbal Scholastic Aptitude Test (SAT) scores of students over an 18-year period through 1980; and
- students prepared for post-secondary study. Remedial mathematics enrollments at four-year institutions of higher education increased 72 percent between 1975 and 1980, while total student enrollments increased by only seven percent. At public four-year colleges, 25 percent of the mathematics courses are remedial; and at community colleges, 42 percent are.

The proportion and qualifications of high school seniors who will major in mathematics, science, and engineering have remained roughly constant over the past 15 years, although college engineering enrollments have increased steadily since the mid-1970's. Some students are also receiving more advanced experiences in secondary school science and mathematics as indicated by performance on advanced placement tests.

Nonetheless, adequate mathematics and science course opportunities are not available for *all* talented and motivated students. As many as one-third of U.S. secondary schools do not offer sufficient mathematics to qualify their graduates for admission to accredited engineering schools. Only one-third of the 21,000 U.S. high schools teach calculus, and fewer than one-third offer physics courses taught by qualified physics teachers.

The evidence on student participation and achievement indicates a wide and increasing divergence in the amount and quality of the mathematics, science and technology education acquired by those who plan to go on to college and study in those areas and by those who do not. Students in the latter category generally stop their study of mathematics and science at a relatively early age, perform considerably less well on achievement measures than the career-bound, and do not have opportunities to pursue appropriate courses in contemporary technology. Only nine percent of the students graduating from vocationally oriented secondary school programs in 1980 took three years of science, and only 18 percent took three or more years of mathematics. Hence, it is clear that while the first goal stated in the introduction presently is being fulfilled reasonably well, the second and third goals are not. In fact, the educational system may actually have carried out these latter goals better 20 years ago: the proportion of public high school students (grades 9 to 12) enrolled in science courses has declined since that time. Thus, the principal concern with student participation and achievement is with those who do not plan careers in mathematics, science, or engineering.

In addition, wide differences persist in achievement and participation levels among students from different social groups. Women have traditionally participated less than men in science, and members of various minority groups (specifically, if not exclusively, American Indians, Black Americans, Mexican Americans and Puerto Ricans) have participated less and performed less well on standard science and mathematics achievement tests than their white counterparts. Approximately 20 percentage points separated the mathematics achievement scores of 17-year-old black and white students on national assessment tests in both 1973 and 1978. Approximately 15 percentage points separated 17-year-old Hispanics and whites in both years. Between 1973 and 1978, nine-year-old black students showed a definite improvement in performance on mathematics achievement tests, while the average performance of nine-year-old white students declined and that of Hispanics remained constant.

Studies and analyses of conditions in the U.S. educational system—including both its formal and its informal components—point to four problems that contribute to declining student participation and achievement levels.

Teachers

Individual teachers have considerable discretion in the selection of course content and instructional approaches and, therefore, play a pivotal role in the education of students. Superior teachers of mathematics, science and technology can motivate students to do well in their courses and can stimulate students to take more advanced courses and consider technically or scientifically oriented careers. Mediocre and poor teachers may dampen the enthusiam of good students and fail to recognize and stimulate the development of potential talents in others. Therefore, the documented shortage of superior teachers must be considered a prime contributing cause of decreasing student participation and achievement in mathematics, science and technology.

There is also a growing shortage of qualified secondary school mathematics and physical science teachers. In 1981, 43 states (of 45 responding) reported a shortage of mathematics teachers. For physics teachers, 42 states reported such shortages. In the same year, 50 percent of the teachers newly employed nationwide to teach secondary science and mathematics were actually uncertified to teach those subjects. From 1971 to 1980, student teachers in science and mathematics decresed in number—threefold in science and fourfold in mathematics—and only half of them have actually entered the teaching profession. In addition, 25 percent of those currently teaching have stated that they expect to leave the profession in the near future.

Some of the problems that affect the participation and achievement of students at all grade levels are:

- Among certified teachers of high school mathematics and science, very few have had the formal educational preparation required to provide students with an understanding of modern technology.
- There are few available opportunities for certified mathematics and science teachers to update or broaden their skills and backgrounds. Such training opportunities are essential due to the rapid advances taking place in mathematics, science and technology and the need to introduce new types of upper level courses for nonspecialists.
- There are few inservice programs to certify teachers who are presently not qualified to teach mathematics and science.

- Most teachers in the primary and middle school grades have not had training in science and mathematics or courses in methods to teach these subjects.
- District-level supervision has been reduced as a result of financial retrenchment or has been shifted from instructional to administrative support. As a result, relatively few people are available outside the classroom to provide quality control or to assist teachers with pedagogical problems.

Classrooms

Deficiencies in the numbers and qualifications of mathematics and science teachers are exacerbated by classroom conditions, including inadequate instructional time, equipment, and facilities.

The time available for adequate instruction in U.S. schools is far more limited than in other advanced countries. In the United States, the typical school year consists of 180 days, as contrasted with 240 days in Japan. This is further reduced by absenteeism, which amounts to an average of 20 days per school year. The typical school day is five hours long, compared with six- or eight-hour days in other countries. In addition, many periods of varying length throughout school days and weeks are devoted to nonacademic pursuits, both reducing the hours available for instruction and diverting the time and energy of teachers to noninstructional duties. Problems associated with student discipline and motivation, which are severe in some schools and affect the general learning environment, have been well publicized.

Many science courses in schools throughout the country are being taught without an adequate laboratory component or with no laboratory at all. In some cases, laboratory apparatus is obsolete, badly in need of maintenance, or nonexistent. In other cases, such apparatus is not used because of a lack of paraprofessionals or aids to set up and maintain equipment, a condition that has become increasingly important due to the greater concern for safety in the schools.

Curricula

Curricula in mathematics and in several scientific disciplines were developed with federal support two or more decades ago to provide rigorous, modern course work for high school students interested in careers in mathematics, science and engineering. These curricula, and several generations of privately-developed successors, continue to serve their purpose, though many need to be revised. Mechanisms must be developed to incorporate effectively into the curricula changes associated with advances in the disciplines and evolving contemporary technologies.

Another curricular concern is that upper level high school courses based on these curricula are too abstract and theoretical for most students. In fact, serious doubts exist about whether many of the commonly offered mathematics, science and technology courses in the secondary schools are, in their present form, of much value to students planning careers outside of mathematics, science or engineering. Few courses or widely accepted curricula are available with the explicit aim of providing such students with adequate preparation in mathematics and science. In addition, courses associated with modern technology are not available; most courses, in fact, make little reference to technology at all.

In the lower grades, mathematics courses emphasize basic computational skills rather than interpretation and application. Science courses at those levels often are empty of content and, generally, do not build upon the work of previous grades.

Appropriate courses in modern technology are not available. Few systematic attempts are made to integrate learning in mathematics, science and technology. As a result, little coherent preparation is offered for the disciplinary courses (usually earth science and biology) encountered for the first time in the ninth and tenth grades. This condition is particularly unfortunate, because a wealth of information supports the conclusion that students who dislike mathematics and science courses in the early grades, or who receive inadequate instruction in those grades, are unlikely to participate effectively in upper level courses.

Instructional Approaches

In general, precollege mathematics, science and technology instruction has yet to take advantage of the advances in technology and behavioral science of the past 20 years. For example, computers provide an immense opportunity to develop curricula and instructional approaches that might motivate larger numbers of students and increase the flexibility of the programs available to them. Computers and other modern technologies are available in many U.S. schools, and imaginative uses are made of these instructional aids in individual classrooms. However, computer software is generally inadequate, and the full potential of these technologies for instruction has received little attention.

Considerable progress also is being made in research in math and science education. The cognitive sciences are providing a wealth of informatin on the way people learn. For example, knowledge is now available about the relative degree of abstraction that students of a particular age can be expected to grasp. However, such information has yet to be systematically applied either in the development of mathematics, science, and technology curricula, or in the training of teachers of these subjects.

Finally, there is evidence that many students who have an interest in mathematics, science, and technology are not being reached through instructional approaches currently used in the classroom. Whereas many students do not like school science—and form this opinion by the end of third grade—many do like the science and technology that they see on television. They also like what they encounter at science and technology museums, planetariums, nature centers, and national parks. Many of these institutions facilitate science and technology education with their own after-school, weekend, and vacation classes. In addition, many school classes make field trips to such institutions. Because these programs are apparently more appealing than school science offerings, the innovative instructional approaches used in them should be examined and, where possible, applied to the classroom setting.

Largely, public schools reflect, rather than determine, public perceptions and priorities. The condition of mathematics, science and technology education reveals an apparent misperception by the public that adequate course work need only be provided to students preparing for college-level study in these fields and that these courses are unnecessary for other students. This is consistent with the broader perception that excellence in science and technology is vitally important to the Nation but that it can and should be left to the experts. Thus, its pursuit has little to do with the day-to-day concerns of most people—except when major news events such as a nuclear reactor accident or a space shuttle launch intrude. This misperception about the mathematics, science and technology training needed by students in our schools is tragic for our society as a whole.

Yet, a reasonable fraction of the adult public is interested in science and technology. This is evident from the recent popularity of science magazines for nonspecialists, quality television and radio programs (particularly in the public media), and science and technology museums. Although a large fraction of the public enjoys science and technology, it appears that many consider school mathematics, science, and technology as isolated from the real world and not essential for most students.

That misperception is part of a public view that the aims, substance, and quality of public education do not reflect the considerable economic, social, and cultural changes that have occurred in this country since the late 1960's. Today, an increasing percentage of the work force is concerned with the retrieval, processing, and transmission of information. Yet, public school mathematics and science courses are, at best, only peripherally concerned and preparing students to work and live in a society that concentrates on such tasks.

Apparently, no consensus has been reached that the future prosperity and international position of the United States depend critically upon broader public attainment in mathematics, science, and technology. In addition, there is no consensus that high quality mathematics, science, and technology education is a matter of national concern, transcending state and local interests and responsibility. Mathematics and science requirements both for high school graduation and for college entry have generally declined over the past 15 years. Although there are some encouraging signs that this trend is reversing, only about one-third of the Nation's 16,000 school districts require more than one year of high school mathematics and one year of science for graduation.

The absence of a national consensus on the importance of mathematics, science, and technology education for all citizens may be the central cause of the critical problem facing our educational systems. A broad national effort is essential. The National Science Board Commission on Precollege Education in Mathematics, Science and Technology has been established to address this condition. The Commission will define, over the next year, a national agenda that should provide an action plan for all sectors of society to use in the achievement of the three important educational goals outlined in the introduction to this report.

Sources

The data appearing in this report have been drawn from the sources that follow. Specific citations and additional references may be obtained on request from the office of the National Science Board Commission on Precollege Education in Mathematics, Science and Technology.

1. National Science Foundation and Department of Education. *Science and Engineering Education for the 1980's and Beyond.* Washington, D.C.: U.S. Government Printing Office, October 1980, primarily Chapter V.
2. National Science Foundation. *Science and Engineering Education: Data and Information 1982. A Report to the National Science Board Commission on Precollege Education in Mathematics, Science and Technology* (NSF 82-30).
3. Papers presented at the National Academy of Sciences' Convocation on Precollege Education in Mathematics and Science, particularly Paul DeHart Hurd, "State of Precollege Education in Mathematics and Science," (May 12-13, 1982).

INTERIM REPORT TO THE NATIONAL SCIENCE BOARD

A REPORT OF THE NATIONAL SCIENCE BOARD COMMISSION ON PRECOLLEGE EDUCATION IN MATHEMATICS, SCIENCE AND TECHNOLOGY—JANUARY 1983

NATIONAL SCIENCE BOARD
NATIONAL SCIENCE FOUNDATION
WASHINGTON, D.C. 20550

NSB COMMISSION ON PRECOLLEGE
EDUCATION IN MATHEMATICS,
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January 20, 1983

Dr. Lewis M. Branscomb
Chairman
National Science Board
National Science Foundation
Washington, DC 20550

Dear Dr. Branscomb:

It is our privilege to transmit to you the first interim report of the National Science Board Commission on Precollege Education in Mathematics, Science and Technology, as required by our charter. This report summarizes the NSB Commission's activities to date.

We are gratified to note at this time evidence of increasing concern about and action toward improving precollege education in mathematics, science and technology in this country. This increase in concern and activity can be seen in all sectors of society. As suggested in the Commission's first report, Today's Problems, Tomorrow's Crises, a national consensus on the importance of a broad understanding of these fields for all students is a prerequisite for the success and persistence of any improvements this Commission may recommend in the Nation's educational systems.

Transmittal of this report to you marks the formal beginning of the third phase of the Commission's activities, directed explicitly toward developing its eventual recommendations. Throughout this third phase, we shall continue to interact with the numerous groups and individuals with interest and roles in precollege education in mathematics, science and technology, so that we may continue to benefit from their advice and counsel as we move toward the completion of our work.

Sincerely,

Cecily C. Selby

William T. Coleman, Jr.
Cecily Cannan Selby

The National Science Board established the Commission on Precollege Education in Mathematics, Science and Technology in April 1982, in response to a growing concern about the Nation's ability to provide the kind and quality of education at the precollege level that our increasingly scientific and technological society requires. A high quality education in these fields is needed for all students if the United States is to be economically and militarily secure, if its workers are to be equipped for the jobs of tomorrow, and if its citizens are to be able to develop and participate fully in the society of the future.

Some of the problems facing the Nation's educational systems are reflected in a well-documented decline in student participation and achievement in mathematics, science, and technology just when the forward momentum of society depends increasingly on these fields. The Commission's first report, *Today's Problems, Tomorrow's Crises,* issued in October 1982, pointed to the danger the Nation faces of raising a generation of Americans with inadequate understanding and skills to participate fully in the world in which they will live and work. The growing shortage not only of superior teachers but of adequate teachers of secondary school science and mathematics, the inadequacy of instructional time, equipment, and facilities, the failure of coursework to reflect the needs of tomorrow, and the need for new instructional technologies and approaches to reach all students of today, were cited in that report as major problems relating to the decline in student participation and achievement.

Underlying these issues and, in the Commission's view, constituting the root cause of declining student interest and performance, is the lack of a public consensus that a broad understanding of mathematics, science and technology is necessary for all students. In its first report, the Commission termed this lack of consensus "tragic for our society as a whole." The costs of failing to prepare all of our children for today's world and that of the future will be deep and enduring—not only for them as individuals but for our Nation's democratic processes, our economy, and our national security.

The NSB Commission was convened to address problems whose existence—if not whose full complexity—is already well-documented. Thus, the Commission was not established to conduct another study of the "precollege education problem." Rather, the Commission's charge, its three principal goals, and its plan of organization and operation are action oriented.

Commission Charge

As charged by the National Science Board, the Commission is to:

1. Examine the existing evidence on the quality of precollege (all classes, K-12) education in mathematics, science and technology;
2. Identify where current practices and policies fail to ensure the entry, selection, education and utilization of the full range of potential talent in science, mathematics, and engineering;

3. Identify and analyze existing mathematics and science programs, teaching materials and teaching techniques whose success may justify imitation or adaptation;
4. Develop an understanding of the roles that all systems—government and private organizations, professional groups and individuals—can play in improving mathematics and science education; and
5. Establish a set of principles, options and strategies which can be used to improve the quality of science and mathematics education.

Commission Goals

The Commission is responding to the charge from the National Science Board in the context of three goals the Commission holds for the Nation's formal and informal educational systems as they relate to mathematics, science and technology. These goals were agreed upon by the Commissioners at their first meeting in July 1982 and direct their work.

- To continue to develop and to broaden the pool of students who are well prepared and highly motivated for advanced careers in mathematics, science and engineering;
- To widen the range of high-quality educational offerings in mathematics, science and technology at all grade levels, so that more students would be prepared for and thus have greater options to choose among technically oriented careers and professions; and
- To increase the general mathematics, science and technology literacy of all citizens for life, work and full participation in the society of the future.

Organization of Activities

The charges to the Commission can be viewed as time-sequenced: there is a need to be clear about the problems being approached (Charge #1 above) before it is possible to determine and evaluate accurately the effectiveness of current policies and practices related to those problems (Charges #2, 3, and 4). Then, there must be understanding of current policies and practices before effective recommendations can be developed (Charges #4 and 5). The Commission has organized its activities accordingly and is addressing the charges in order.

The first of the charges, concerned with defining the specific problems to be addressed, was accomplished in July 1982, at the Commission's first full meeting, and a formal report defining and describing those problems was published in October 1982. This report, *Today's Problems, Tomorrow's Crises,* was transmitted to the National Science Board and, in keeping with the NSB Chairman's recommendation, has been distributed widely. Over 27,000 copies of this report have been circulated to date, including a copy to each of the Nation's 16,500 school districts.

The Commission's work since July has been directed toward the second, third and fourth charges listed above. During this phase of activity, the Commissioners are examining current educational practices and considering programs and policies which offer the greatest potential for helping to realize the goals for the Nation held by the Commission.

The next phase of activity, developing the Commission's final recommendations, was begun in January 1983.

One of the purposes of the Commission's activities thus far has been to determine what the various sectors of society view as the critical changes needed in America's precollege educational systems. It is still too early to generalize from the Commission's discussions with diverse institutions and individuals or to recommend any single most important change or simple set of changes. However, there are many indications of growing awareness and concern in all sectors that significant changes are needed. Many groups with which the Commission has met or corresponded concur that precollege education in mathematics, science and technology should be a higher priority item on all agendas.

Increased awareness of the need for change and for greater involvement can be seen in all sectors. The large number of hearings held and bills introduced in the Congress related to precollege education is one such indication. The Executive Office of the President has indicated in discussions with Commissioners the Administration's growing concern for the Nation's educational systems. The subject of precollege mathematics and science education is a major item in the discussions of the Department of Education's National Commission on Excellence in Education.

There also are indications of increased awareness at the level of State and local governments. Significantly, many states, including Arizona, California, Delaware, Florida, Minnesota, New Jersey, North Carolina, Texas, Virginia and Wisconsin have established their own task forces and are developing plans to increase their science and technology capabilities. In all cases, precollege education in these fields is included as a high priority item. The States have recently joined with educators and industry representatives in a Task Force on Education for Economic Growth, established through the leadership of the National Governors' Association. Some local school districts have moved to address precollege educational deficiencies and difficulties, with particular emphasis on mathematics, science, and computer literacy.

Precollege mathematics, science and technology education problems have been featured in many national media presentations. Most major TV networks have aired discussions of the problem within the past six months.

A large number of professional societies and organizations are focusing attention on precollege education in mathematics, science and technology. The National Academy of Sciences and the National Academy of Engineering convened a national convocation in May 1982 to consider the state of precollege mathematics and science education. The American Association for the Advancement of Science has recently formed a Coalition for Education in the Sciences, to increase the involvement of professional scientists and engineers in precollege mathematics, science and technology education.

Major professional teacher organizations have recently completed studies dealing with science and mathematics and have issued policy recommendations for actions in the years ahead. For example, the National Council of Teachers of Mathematics has coupled a study, *Priorities in School Mathematics,* with the findings of two mathematics assessments carried out by the National Assessment of Educational Progress to produce *An Agenda for Action: Recommendations for School Mathematics of the 1980's.* The National Science Teachers Association recently published a position statement, *Science-Technology-Society: Science Education for the 1980s,* and the National Association of Biology Teachers has just published a report, *New Directions in Biology Teaching: Perspectives for the 1980s.* The National Education Association is underwriting a series of publications devoted to individual content areas, and the American Federation of Teachers has invited experts in mathematics and science education to consult with AFT decisionmakers.

There is evidence of increasing interest and activity in the business community, which long has been active in precollege education, although in many cases to a limited degree. The importance of precollege education to business and industry was emphasized by a recent study by the New York Stock Exchange, *People and Productivity: A Challenge to Corporate America.* That study suggested that many problems in American business productivity may well be related to the quality of this country's precollege mathematics and science educational systems. Such major organizations as The Conference Board, the Committee for Economic Development, and the Business-Higher Education Forum are looking at the precollege education problem in an effort to understand what business and industry can do to help.

Thus, during the first six months of its work, the Commission has observed a marked increase in concern about precollege mathematics, science and technology education in all sectors of our society and a growing awareness that changes are needed. However, there is not yet agreement about the particular changes that should be made, about who should effect them, or about how changes might best be implemented. One of the important prerequisites for any change is agreement about the goals to be met. The Commission has not yet seen such agreement about educational goals, although it is clear that all sectors examined are playing a more active role in setting them. One way the Commission might be helpful in later stages of its activity is through integrating the perspectives of those various groups. Real and enduring improvements in the U.S. educational systems probably will come only from a concerted and sustained effort involving partnerships among all sectors of society.

After satisfying the first of its charges at the July 1982 meeting, the Commission organized itself into four Task Groups, whose activities have been directed primarily at Charges 2 through 4. Those charges involve analyzing current policies and practices affecting precollege education (#2), examining existing approaches to improving precollege education (#3), and considering the roles that various sectors of society can play in bringing about changes in the Nation's precollege educational systems (#4).

Since the July meeting, each Task Group has focused on the policies, activities, roles and relationships of one set of groups with interests in the area of precollege mathematics, science and technology education:

- The Task Group on Governments focuses on the perspectives and activities of Federal, State and local governments, including local school boards;
- The Task Group on Educators focuses on those individuals involved directly in the education of students, including teachers, principals, other school administrators, and curriculum developers;
- The Task Group on Facilitators focuses on groups which indirectly affect or facilitate education, such as professional associations, private and corporate foundations, business and industry, museums, and the media; and
- The Task Group on Recipients focuses on institutions and organizations, such as private industry, the military, and institutions of higher education, that employ or receive students who emerge from the precollege educational system.

Each Task Group of four or five Commissioners has added from three to five additional members to broaden the expertise of the Group. A full listing of Task Group members is provided in Appendix I.

Since July, Task Group members have been meeting with a large number of individuals and groups and have been visiting a wide range of institutions. A detailed listing of site visits made, meetings attended, and groups contacted is provided in Appendix II.

In addition to activities of the individual Task Groups, the Commission has met three times as a group since its first meeting in July 1982—in October and December 1982 and in January 1983. The Commission also held its first public hearing on December 15, 1982, at the Fernbank Science Center in Atlanta, Georgia. That hearing focused on the issue of access to high quality precollege education in mathematics, science and technology for all citizens.

Some highlights of both individual Task Group and full Commission activities follow.

Task Group on Governments

Since its first meeting in July, the Task Group on Governments has met with representatives of Federal, State, and local governments, including local school boards, to obtain their views of the condition of precollege mathematics, science, and technology education, of the major issues involved, and of the current and potential roles of Federal, State and local governments in this area.

Meetings have been held with representatives of White House policymaking offices, Federal agencies, Congressional committees, and national associations representing the states. The latter have included the National Governors Association, National Conference of State Legislatures, Education Commission of the States and others. The Task Group was represented at the annual meetings of several of these organizations.

Three days of intensive discussions were held by the Task Group with education policymakers in Arizona, including the Governor, state legislators, the Superintendent of Education, Board of Education President, School Board Association Director, and other education officials at the state level. This state was selected because its elementary and secondary school enrollment increased at a faster rate in the 1970s than that of any other state, it has been cited as a model for joint educational and industrial development programs, and it recently announced a major program to upgrade precollege mathematics and science education.

The Task Group was represented in discussions with California gubernatorial, legislative, and higher education representatives; at the first session of the newly formed Virginia Governor's Task Force on Science and Technology; and at a Wingspread Conference on new directions in Wisconsin's science education. Contacts and exchanges have occurred with the North Carolina Governor's Task Force on Science and Technology, the Maryland Governor's Science Advisory Council, and the Delaware Governor's Task Force, among others. Steps are being taken to obtain a complete inventory of state initiatives in precollege math and science education.

The Governments Task Group has added to its membership a state governor, state legislator, president of a state school board association, president of a state board of education, and president of a local school board. Six of the nine Task Group members are present or former local school board members.

Task Group on Educators

The Task Group on Educators has engaged in a number of activities focused particularly on the needs of students and teachers in the classroom. It has solicited the views of outstanding teachers at the precollege level on what must be done if mathematics, science, and technology education at this level is to be improved. Financial support has been provided to the National Science Teachers Association to continue its work of identifying illustrative school programs in the sciences and the factors that contribute to their effectiveness. The Task Group has also identified companies that provide creative computer programs for science and mathematics education.

In the important area of curriculum, the Task Group has undertaken a number of initiatives. The Conference Board of the Mathematical Sciences convened a meeting to determine what should be considered fundamental in today's K-12 mathematics curricula. A report was presented to and discussed by the full Commission (see below). Similar efforts are being conducted for precollege curricula in the physical sciences by the American Chemical Society and, for precollege education in technology, by the NSF Engineering Advisory Committee. At the request of the Task Group, the Federation of Behavioral, Psychological and Cognitive Sciences organized a meeting in December to identify findings from cognitive research which have implications for precollege teaching and learning.

The Task Group on Educators has added to its ranks an applied mathematician from industry, a computer education specialist and an elementary school assistant principal who has also been a science teacher.

Task Group on Facilitators

A series of meetings has been held by this Task Group. A large variety of groups have participated, including professional associations of scientists and engineers and of science and mathematics teachers, higher education associations, private and corporate foundations, major industries that have initiated educational efforts at the precollege level, associations of science and technology centers, and various media groups.

These meetings have focused on what these groups and organizations see as possible avenues of action in their role as indirect educators or facilitators, and ways in which the Commission can be helpful to them. Functioning in a number of ways—as opinion leaders, developers of public awareness, producers of educational programs for schools, museums, and the media, purchasers of advertising, or representatives of those directly involved in the education process—these groups have an important bearing on education at many points.

In addition, Task Group members have met with such educational institutions as the Educational Testing Service and the College Board and with representatives of major business groups, the AFL-CIO, publishers' associations, and others.

Additions of persons to the Task Group thus far include the vice president of a major private foundation, a key education official from an association of science societies and the executive director of an association representing a group of science and technology museums.

Task Group on Recipients

This Task Group has focused on business and industry, the higher education community, and the military as employers and teachers of students emerging from secondary schools. It has been recognized, for example, that business and industry and the military play significant roles as educators. This includes the provision of remedial education to compensate for inadequacies at the precollege level.

Major meetings held by the Task Group have included discussions with representatives of the petroleum, electrical, manufacturing, banking, and life insurance industries to discuss how well business and industrial manpower needs are being met. These meetings also focused on ways these groups are now collaborating and might increasingly collaborate with education institutions and units of government to help upgrade precollege mathematics and science education.

This Task Group also held a meeting with 30 representatives of the higher education community to discuss the problems they perceive and to hear how this community can contribute to strengthening precollege mathematics and science education. Representatives of a variety of institutions of higher education reported the trend toward increased remedial instruction in mathematics on their campuses, regardless of differences in student populations or in admissions criteria. Examples of colleges and universities working with local schools to improve these problems were noted.

Attendees at this meeting of higher education representatives also suggested to the Commission that what is most important for entering students is facility in mathematics. Mathematics and science faculty want students to have interest in and curiosity about science. However, these individuals argued that, in terms of what entering students need, strong high school preparation in mathematics to the precalculus level is most important for making all of science, as well as mathematics, viable options for students to pursue.

The Task Group on Recipients has also been meeting with representatives of the military to learn about ongoing programs, such as those conducted by the DoD's Office of Research and Laboratory Management, and those of the Defense Communications Agency, involving high school student apprenticeships in science and engineering, work-study programs, and other efforts to interest them in science and engineering careers.

The Task Group on Recipients has added three members: an official in charge of education programs for a leading chemical corporation, the president of a higher education association, and the director of corporate contributions for a major oil company.

Some Commission-Wide Activities

In addition to meetings and activities related to the work of the individual Task Groups, the Commission has carried out a variety of activities that cut across Task Group lines. One such ongoing activity is concerned with examining the question of what are the fundamentals of mathematics, science and technology that all students must know. A part of this activity was a workshop organized by the Conference Board of the Mathematical Sciences that grew out of the Commission's first meeting. That workshop expressly addressed the question of what should be considered fundamental or essential in the mathematics K-12 curriculum, and the Executive Summary of the CBMS report to the Commission is attached to this report as Appendix III. Similar investigations into the fundamentals of other disciplines are now in planning stages.

The Commission held its first public hearing on December 15, 1982, at the Fernbank Science Center in Atlanta, Georgia. The topic of the hearing was "Access to High Quality Education in Mathematics, Science and Technology for All Citizens." The need to ensure access to high quality education for all students is emphasized by all three of the Commission's goals. The topic of access was considered in the broadest sense. Testimony was presented by students and other individuals from across the country with experience in a variety of existing programs, including those directed toward increasing access in rural and urban settings and to increasing the participation of women, minority, physically handicapped, and economically disadvantaged students in precollege education. The emphasis in testimony was on special features of, or lessons learned from, existing programs that have implications for all groups of students. The agenda for the hearing is attached to this report as Appendix IV.

A number of points were raised at the December hearing that will receive additional consideration as the Commission's work proceeds. For example, many speakers suggested that "positive intervention" or "enrichment" approaches are now being used more than are traditional "compensatory education" or "remedial" instruction approaches. The point was made that major predictors of success in mathematics and science include getting students into a specific precollege mathematics sequence and/or into individualized counseling and support programs and building up good academic habits at early levels. Speakers also emphasized the need for collaboration among local schools, colleges, industries and parents in designing and implementing new precollege programs. As a final example, some speakers asserted that teacher training in the future may well be different from teacher training in the post-Sputnik era. Teachers of the future may become facilitators of learning, rather than dispensers of new knowledge. Therefore, teacher training approaches may need reevaluation.

Speakers at the hearing also pointed out the usefulness of computers in instruction at all grade levels. They also suggested teleconferencing as a means of providing inservice education for teachers. A full transcript of the hearing is available on request from the Commission Office.

A third example of Commission-wide activity is provided by the Commission's beginning deliberations on the relationship between technology and education. As expressed in *Today's Problems, Tomorrow's Crises,* Commissioners have already recognized the need to educate students about technology. Over the coming months, the Commission will also be considering the effects of technological advances on the processes of teaching and learning. There is already evidence that the educational enterprise could be altered dramatically by advances in the technology of learning. The potential of computers, telecommunications, information data bases, and other high technology equipment and resources must be carefully evaluated to determine their optimal use in teaching and learning. Major changes in educational methodology may have an overwhelming impact on the direction of future educational activities. This topic of technology and education was a principal focus of the January 1983 Commission meeting and will remain a subject for ongoing deliberation as the Commission carries out its remaining charges.

It should be mentioned as a final note that many of the Commission's activities have had and will continue to have a positive impact on the level of public awareness about the need for a broad understanding of mathematics, science and technology for all citizens. As listed in Appendix II, the Commissioners have been very active in meeting with different groups and in articulating the precollege education problem to numerous audiences. Commissioners have addressed many professional and civic organizations and have presented testimony before Congress. The public hearing in Atlanta received wide news coverage, and portions of the hearing, as well as a discussion involving Commissioners of precollege education issues, were televised nationally. These public awareness activities will continue throughout the Commission's work.

Question: What were the Administration's considerations in deciding the respective roles of NSF and the Department of Education in science and mathematics education? Please explain NSF and the Department of Education roles as they are included in the FY 1984 budget.

Answer: As described in NSF's 1983 plan for pre-college science education, the NSF and Department of Education roles were based on considerations of their statutory authority, and agency capability and capacity based on authority, experience, public support, and support of the involved communities.

NSF cannot speak directly to the Department of Education 1984 budget. However, the NSF 1984 budget reflects these two considerations with a program based on:

o awards based on competitive peer review, whose primary criterion is the scientific/science educational merit of the proposed ideas and activities;

o NSF's strengths with the academic scientific and engineering community and science teaching profession, and

o identification and support of innovative projects which typically are generated through scientific and technical experts (rather than NSF).

RESOURCE CENTERS FOR SCIENCE AND ENGINEERING

The Southwest Regional Resource Center, funded by NSF, is in its final year of funding.

Question: What is the rationale behind resource center funding?

Answer: In FY 1978, the first of four Resource Centers for Science and Engineering was funded with a grant of about $2.7 million for a four-year period. This funding pattern was a result of Congressional instructions. It provided concentrated initial funding with a maximum degree of flexibility for the Resource Centers to undertake activities to improve the access of minorities and low-income students into careers in science and engineering.

Question: Over the period of time science resource centers have existed, has NSF ever considered its policy of limiting support to four years?

Answer: The original plan of NSF for funding resource centers contemplated a large initial grant, a period without direct program support, followed by a modest booster grant in year 6 or 7. NSF has not had funds available for such booster grants.

Question: What, if any, are the resource centers' responsibilities with respect to accountability to NSF?

Answer: Resource centers are subject to the normal NSF policies and practices regarding accountability. This includes the furnishing of annual progress and fiscal reports to NSF. Additionally, site visits by NSF staff and other experts, and occasional project director meetings, provide opportunities for observation by the Foundation.

ONE-YEAR FUNDING INCREASE

Question: The Administration's FY 1984 budget request for NSF is a significant increase over FY 1983. However, that increase is not sustained in the out years. What is the rationale for this?

Answer: In accordance with OMB instructions, the National Science Foundation's budget authority out year projections beyond FY 1984 are only extensions of the proposed FY 1984 level. They do not include adjustments for inflation, expansion of existing programs, initiation of new programs or increases for specific items such as construction projects or purchase of large equipment.

ENGINEERING SHORTAGE

Question: There is a well-documented shortage of engineering faculty in colleges and universities. The FY 1984 budget includes a proposal to address this critical problem. Please describe this proposal and the propositions which are considered in its development.

Answer: The situation with regard to the supply and demand for faculty in the schools, colleges and programs of engineering is complex and continually changing. The "shortages" of faculty have been variously estimated: some studies have characterized them as about a 10% vacancy rate, in 1980 and 1981, in the permanent, full-time positions in 244 colleges and universities with accredited engineering programs; others have estimated about 2,500-5,000 more faculty are needed in 1981-1982, without clearly indicating the basis for this estimate. In either case, these and other estimates are national averages that obscure differences among schools and specialties in engineering.

The "shortages", however measured, are considerably less in an area like aeronautical engineering than in computer engineering. And they can change rather quickly, depending on changes in the market or in large federal programs. For example, the recent decline in oil prices appears to have altered quickly the demand for petroleum and chemical engineering. A large increase in federal spending for space or aircraft could produce a temporary shortage of aeronautical engineers, just as the reduction in federal aerospace programs in the late 1960s soon resulted in headlines about unemployed aerospace engineers.

Similarly, a student's decision to remain in graduate school or to seek employment upon receipt of the baccalaureate is clearly affected by the market and the demand for particular specialties. Thus, at least until recently, students with undergraduate specialties in aeronautical engineering or civil engineering were more likely to pursue graduate work than those in computer or electrical engineering where 'high technology' industries have created a strong demand for such specialties. When demand falls, graduate enrollment often goes up.

The "shortages" appear to be much less a problem in many of the larger more prestigious research universities, or universities that are still growing, than in other academic institutions where teaching loads have often been traditionally higher or where the university has been unable or unwilling to limit undergraduate enrollment. Furthermore, while reference is frequently made to the fact that academic institutions are unable to compete with industry and are losing faculty members to industry, figures in a recent national survey indicated that colleges and universities have recruited almost as many people from industry as they have lost to industry. Unfortunately, it is probable that institutions successful in recruiting from industry because of the research and teaching environment they offer are not the same institutions losing faculty members to industry.

The Foundation is aware of the volatile nature of engineering demand and supply and the frequently local impact on a given institution. Consequently, NSF has not attempted -- even if it could -- to design the FY 1984 program to offset the effects of this continually shifting, complex situation with any 'quick fixes' or targeted manpower programs. Instead, NSF has focused on developing the knowledge base in engineering and on improving the general attractiveness of academic research and teaching careers in engineering by improving the quality and availability of research instrumentation and by expanding research opportunities for young investigators.

Support for basic research in engineering in the FY 1984 request is increased by $22.2 million or 22 percent over FY 1983, the largest percentage increase for any of the Foundation's research activities. This increase will fund a growing number of senior investigators (2,255), postdoctorates (176), and graduate research assistants (2,030). Within this total, support for research equipment will be increased significantly over FY 1983, from $8.7 million to $18.2 million. In addition, increased support for young faculty is being provided through the Research Initiation Grants program and the newly established Presidential Young Investigators program. It is estimated that as many as half of the 200 Presidential Young Investigators in FY 1984 may be in engineering schools.

While changes in the market place are probably the primary determinants of an undergraduate student's choice of a major and his or her subsequent decision to remain in graduate school or to seek employment, NSF believes that opportunities for first-hand experience with faculty research in engineering also may be important, at the margins, in shaping these decisions. For this reason, in FY 1983 and FY 1984, requests will be considered by program directors in the engineering activity for supplemental funding of existing grants to add undergraduate student research assistants.

GRADUATE ENGINEERING FELLOWSHIPS

Question: The FY 1984 budget increases graduate engineering fellowships to $8,100 per year. How does this level of support compare to other federal agency stipends?

Answer: The FY 1984 budget for NSF raises the Graduate Research Fellowship remuneration levels to $8,100 for the stipend and $4,900 for the cost-of-education. For FY 1983 these levels were $6,900 and $4,000, respectively.

Senator Domenici—Continued

Comparable data for other federal agencies are also for FY 1983. The other major federal programs are NIH ($5,700; tuition + $1,500) and Department of Education ($4,500; $3,900). Smaller federal programs range from NASA ($10,000; $5,000) to ONR ($12,000; tuition + $2,000).

QUESTIONS SUBMITTED BY SENATOR HUDDLESTON

EARTHQUAKE EXPENDITURES

Question: S. 820, as passed by the Senate, includes $27.3 million for NSF Earthquake Hazard Mitigation in FY 84. Please explain how this funding would be used, if finally authorized and appropriated.

Answer: Of the $27.3 million, $19.0 million would be in the Earthquake Hazard Mitigation Program in the Directorate of Engineering (ENG), while $8.3 million is allotted to the Division of Earth Sciences in the Directorate for Astronomical, Atmospheric, Earth and Ocean Sciences (AAEO). The AAEO funds will be expended primarily on basic research in seismology and earthquake mechanisms. The breakdown of the funds ($19.0 million) allocation in ENG is $8.1 million for Siting research, $8.6 million for Design research and $2.3 million for Societal Response research.

Question: Under the Earthquake Hazards Reduction Act of 1977, NSF is responsible for research on earthquake engineering, studies on the social and economic impact of earthquakes engineering, studies on the social and economic impact of earthquakes and disseminating research information to practitioners and agencies. How much did NSF spend on each of these activities in FY 81, FY 82, and FY 83.

Answer:

	EXPENDITURES (million dollars)		
	FY 81	FY 82	FY 83
Earthquake Engineering	15.4*	15.4*	14.3
Social and Economic Impact	1.5	1.6	1.8
Disseminating Research Information	1.3	1.3	1.2
TOTALS	18.2	18.3	17.3

* Includes $1.2M for Strong Motion Instrumentation transferred to USGS in FY 1983

COORDINATION

Question: NSF is only one of the government agencies involved in earthquake hazard mitigation. FEMA and the U.S. Geological Service are also involved. FEMA has the lead agency role. How are activities being coordinated?

Answer: Activities are being coordinated formally through the Interagency Coordinating Committee of the National Earthquake Hazards Reduction Program (ICC/NEHRP), which is chaired by FEMA. Also in existence is the Interagency Committee on Seismic Safety in Construction (ICSSC), chaired by the National Bureau of Standards (NBS). A Policy Group (NSF, USGS, FEMA, NBS) was recently established at a higher level within the agencies. Extensive coordination takes place informally among the agencies (i.e., conferences, workshops, symposia, monthly meetings of the Interagency Discussion Group on Disaster Mitigation, etc.).

Question: Are you at NSF satisfied with the coordination?

Answer: The coordinate is quite effective and continues to improve.

FIVE-YEAR PLAN

Question: Under the Earthquake Hazards Reduction Act, a Five-Year plan was to be developed by September 30, 1981. To date, it has not been submitted. Has NSF been involved in the development of that plan?

Answer: At the request of FEMA, NSF has provided input for the Five-Year Plan. FEMA is incorporating this input into the Federal Five-Year Plan for the participating agencies.

NEW MADRID FAULT AREA

Question: The New Madrid Fault Area includes Western Kentucky. On the basis for your research to date, what can you tell us about siting, design, and societal response?

Answer: The research that is being funded on Siting, Design, and Societal Response is applicable to all areas of the U.S., including the New Madrid area.

Societal Response research has been conducted outside and within the New Madrid region. A significant amount of this research carried out in areas outside the New Madrid region has implications for Western Kentucky and other parts of the region. This includes studies on how views of hazards are acquired; the social, economic, and legal difficulties involved in reducing hazardous conditions, including those related to existing hazardous buildings; studies on evacuation planning and disaster warning; and research on problems related to community recovery and rehabilitation following disaster. NSF-funded researchers are presently engaged in studies on many of these topics in connection with the Coalinga, California earthquake and the results from these studies should be useful to other areas-at-risk, including the New Madrid region.

Question: What would you expect to learn with the requested FY 84 funding?

Answer: We will continue to advance our knowledge in the areas of ground motion, geotechnical engineering, structural design, architecture, planning, and societal response.

More recently, NSF has also increasingly turned its attention to the New Madrid area in part to support initiatives undertaken by FEMA and USGS. For example, a recently completed NSF-supported study analyzed earthquake mitigation effort in Missouri and a current study is analyzing the public's receptiveness to seismic safety initiatives and policies in communities in several Central USA states, including Kentucky. We expect to learn the following with the requested FY 84 funding:

- The major incentives and disincentives for developing and implementing earthquake hazard mitigation policy.
- The status of disaster preparedness and planning in areas of risk.
- The effectiveness of selected hazard information dissemination programs.

Question: When would you expect to have sufficient data to recommend specific actions?

Answer: Many of our research results have already been incorporated into seismic design in building codes throughout the country. These codes are changing continuously as new research results become available. Results from research on societal response are being included in preparedness and recovery plans by other Federal, state and local agencies.

CENTRAL U.S. EARTHQUAKE STUDY

Question: FEMA has undertaken a central U.S. Earthquake Study and is developing a comprehensive earthquake preparedness program for the central United States. Last year FEMA testified that it would take until 1986 to complete the Program. Has NSF been involved in this effort?

Answer: Yes. NSF involvement has included reacting to the plans FEMA is developing and participating in workshops organized by that agency.

Question: Is -- and will -- your research be utilized in this program?

Answer: Yes. NSF-supported research in the Societal Response area is being utilized by FEMA. FEMA has been asked to review proposals under consideration by NSF for research in the Central USA. Researchers on NSF-supported projects have been working with FEMA officials at both the regional and national officies and participating in FEMA-sponsored workshops on earthquake hazard mitigation in the New Madrid region. Also, NSF and FEMA are making plans to jointly support research in the Central USA related to hazard education for the public in the region.

INDUSTRY/UNIVERSITY COOPERATIVE RESEARCH PROJECTS

Question: How many Industry/University Cooperative Research Projects are currently underway?

Answer: Currently, 126 projects are underway, begun in the fiscal years of 1980, 1981 and 1982.

Question: How will the 16 percent increase in the program be applied?

Answer: For FY 1983, $6 million is budgeted for cooperative projects from the Industry/University Cooperative Research Projects Progam (with a matching $6 million from other NSF research programs). The projected number of cooperative projects awards in 1983 is 125.

For FY 1984, a $7 million budget is planned (with a matching $7 million from other NSF research programs). The projected number of cooperative awards in 1984 is 136. The 16% increase will provide approximately a 9% increase in the number of awards and an increase averaging 7% in each award to secure more scientific instrumentation for use by university researchers in the cooperative research projects.

Question: You anticipate three to four new Industry/University Cooperative Research Centers and six to ten planning grants for additional centers under FY 84 funding. Do you know which specific projects will be funded?

Answer: We do not know at this time which specific projects will be funded since a proposal for a prospective center must first go through the peer review system. Eight or nine planning grants in FY 1983 will provide the basis for the three or four Industry/University Cooperative Research Centers to be started in FY 1984. Scientific areas under consideration are engineering, biology, materials, electronics, and chemistry. Potential planning grants under discussion for FY 1984 will address different subjects in these same areas and others, such as computer science.

The University/Industry Cooperative Research Centers Program stimulates industrial support of university research and promotes long-term collaboration between the university and industries. The resultant research program is both compatible with university research objectives and responsive to industry's research needs. Research programs at the centers generally correspond to the university's scientific and engineering areas of expertise and have participants that are or have been principal investigators of other NSF research grants. Before a center is started, mechanisms for university/industry interaction and for industry support must be established, and the research program and its relation to NSF research program interest must be considered. Generally, all Industry/University Cooperative Research Centers develop as the result of a planning grant. The best of the proposed Centers meeting the established criteria are funded by the program. Until all criteria are met and the proposal is reviewed, specific centers cannot be identified.

MATHEMATICS AND SCIENCE EDUCATION

Question: As you are aware, Congress is placing increased emphasis on mathematics and science education. The House of Representatives has passed legislation addressing our needs in these areas and the Senate Subcommittee on Education is marking up their version of the bill. What needs will our country have for students educated in mathematics and the sciences in the coming years?

Answer: As the economy becomes increasingly dependent on science and technology-based industries, strong science and mathematics training will become increasingly important for larger proportions of students.

Question: Are the current programs administered by the National Science Foundation sufficient to assure that we have enough students educated in mathematics and science fields? If not, where do we need to focus our efforts?

Answer: The NSF role is to provide leadership and to perform those activities, such as research and development, which cannot or should not be replicated throughout the states. This alone, however well-planned and funded, cannot completely assure that enough students are well educated in the mathematics and science fields. The major responsibility for education rests in the state and local governments, and their appropriate action with input from the private sector should be the focus of the nation's effort.

Question: The National Science Foundation had $15 million available in FY 83 for helping teachers to upgrade their skills in mathematics and science. Can you give me an example of a program that was operating through this funding? How many colleges and universities across the country received assistance from this program? How many teachers are participating in these programs?

Answer: Approval of the NSF plan for expenditure of FY 1983 funds was received in mid-April, 1983. No awards have as yet been made. The plan has two components, Development of Materials for Teaching Improvement and Teachers Incentives Activities. Although teachers will necessarily be involved as developers and for testing in the materials development activity, it is not a training program. The incentives activity will have a training component, limited in 1983 to approximately 700 teachers by a suggestion of the Appropriations Committee.

Question: What number of graduate research fellowships were awarded by NSF in FY 83?

Answer: Five hundred new Graduate Research Fellowships were awarded in FY 1983. In addition, approximately 1100 Fellows from prior years are eligible for continuation support.

Question: If the mathematics and science legislation that is currently being considered is approved by both houses of Congress and signed by the Presdient, more funding will be available through NSF to upgrade teacher education and research programs. Are you taking any preliminary steps now which will assure that this legislation is implemented in a timely manner?

Answer: The program plan developed for 1983 is intended to serve as a framework for the 1984 program. The program announcements (requests for proposals) are being designed for use in both 1983 and 1984.

Question: What type of technical assistance, if any, will NSF be offering to colleges and universities in setting up teacher retraining programs?

Answer: NSF provides limited technical assistance to projects by (1) informal responses from program officers to questions on proposals and project design and project management, and (2) sending review comments to proposers.

Question: Do you anticipate any difficulties in coordinating your programs with those being undertaken by the Department of Education?

Answer: NSF has contacts with the Department of Education staff at various levels which should provide good means for coordination.

SUBCOMMITTEE RECESS

Senator GARN. The subcommittee will stand in recess until Thursday, April 21, 1983, when we will take up the request of the National Aeronautics and Space Administration.

Thank you.

[Whereupon, at 11:23 a.m. Thursday, April 14, the subcommittee was recessed to reconvene at 10 a.m. Thursday, April 21.]

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT-INDEPENDENT AGENCIES APPROPRIATIONS FOR FISCAL YEAR 1984

THURSDAY, APRIL 21, 1983

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, D.C.

The subcommittee met at 10 a.m. in room SD-124, Dirksen Senate Office Building, Hon. Jake Garn (chairman) presiding.

Present: Senators Garn and Huddleston.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

STATEMENT OF JAMES M. BEGGS, ADMINISTRATOR

ACCOMPANIED BY:
- JACK L. KERREBROCK, ASSOCIATE ADMINISTRATOR FOR AERONAUTICS AND SPACE TECHNOLOGY
- DR. BURTON I. EDELSON, ASSOCIATE ADMINISTRATOR FOR SPACE SCIENCE AND APPLICATIONS
- BILLIE J. McGARVEY, DIRECTOR, FACILITIES ENGINEERING AND COMPUTER MANAGEMENT DIVISION
- DR. HANS MARK, DEPUTY ADMINISTRATOR
- THOMAS NEWMAN, NASA COMPTROLLER
- GEN. J. A. ABRAHAMSON, ASSOCIATE ADMINISTRATOR FOR SPACE FLIGHT
- ROBERT E. SMYLIE, ASSOCIATE ADMINISTRATOR FOR SPACE TRACKING AND DATA SYSTEMS

OPENING REMARKS

Senator GARN. The subcommittee will come to order.

Through work conducted by NASA, the United States continues to lead the world in the exploration of space and development of space technology. NASA's aeronautics research has also been a major factor in our world leadership in the production and export of civil and military aircraft. In addition to our preeminence in space exploration, our investment in NASA also pays off as a direct stimulus to increased national productivity especially in the areas of telecommunications and Earth resources assessment.

Other spinoffs of NASA's technology are less well known but equally important. New products are created and new markets established. The space agency is truly a national resource of scientific and engineering talent that is unmatched elsewhere in the world.

NASA also contributes directly to national security by advancing the state of the art in areas like rocket propulsion, electronics, and composite materials. Many might question NASA's role in performing these national security functions; however, I believe such cooperative efforts are in NASA's and the Nation's best interest.

Since our hearing last year, we have begun the era of operational use of the Space Shuttle. We now have the delivery service needed to pursue the development of a multipurpose space platform.

For fiscal year 1984, you are requesting a total of $7,106,500,000, or $297.3 million over your fiscal year 1983 level and your R&D request of $5,708,500,000 is 3 percent over the fiscal year 1983 level.

Speaking of Space Shuttle, I want to certainly continue to put in the record each year that I still have a great desire to go. I did not want you to be disappointed and think that I would miss stating that and also that my latest physical indicates my resting pulse rate is 58, my blood pressure is 116 over 65, and I still need no corrective lenses of any kind.

My physiological training card, my orange card, peach-colored card, is still intact and I thought the record ought to show those figures. I am 5 pounds less in weight than I was when I played football in high school.

You don't need to reply. I just wanted to let you know that my interest has not waned one bit.

Mr. BEGGS. I can't think of a more appropriate Senator that we would like more to fly the Shuttle, Mr. Chairman.

Senator GARN. Before you start, let me just continue along this vein a little bit, primarily for the record.

On January 13, you sent me a letter asking for my views as to how NASA could make the best use of the limited opportunities to fly passengers on the Shuttle. In that letter, you state that, "NASA has a long tradition of opening the space program to public involvement as opportunities develop." You also note that you have established a task force to identify under what circumstances flights of private citizens would be permitted.

One of the areas already identified by the task force as serving a purpose that is consistent with the Space Act is education of those who fly and, through their experience, the public.

As you know, this is an issue that is near and dear to my heart. I would submit that there is no better person to educate the public as to the meaning of space flight than an elected representative of the people—in particular a senior Senator from one of the Western States—perhaps Utah.

So, I will be anxiously looking forward to the task force's findings and anticipate talking to you personally about how these guidelines should be interpreted. Now we will be happy to hear your testimony.

NASA'S FISCAL YEAR 1984 BUDGET

Mr. BEGGS. Thank you Mr. Chairman. It is a pleasure for me to appear before this distinguished subcommittee to present President Reagan's budget request for NASA for fiscal year 1984. The total request is $7.1 billion, of which $5.7 billion is for research and development, which also includes certain operational funding, $150 million for construction of facilities, and $1.25 billion for research and program management.

Achievements of the past year have been very significant and would not have been possible without the strong and continued support of the Congress. In 1982, the Space Shuttle Columbia made three successful flights and, during each flight, significant progress was made in understanding the operational features of the Shuttle system. This initial phase of the STS flight program culminated with the first operational flight in November 1982, during which two commercial communication satellites were launched.

The Challenger, which had encountered engine leaks and payload contamination problems, completed a spectacular first flight, including the successful deployment of the first Tracking and Data Relay Satellite (TDRS–A), and is now back at the Kennedy Space Center being prepared for its next flight which will take place in June. With respect to TDRS–A, as a result of an anomaly during the IUS second-stage burn, the TDRS–A was injected into an elliptical orbit lower than the desired geosynchronous orbit. The spacecraft has been stabilized and a plan is under development to correct the orbit to the desired altitude commencing in early May. The IUS problem is under investigation by a joint Air Force/NASA team and we expect their initial findings within the next few weeks.

I have great confidence, Mr. Chairman, that the investment this Nation has made in the Space Shuttle will pay off handsomely. Accordingly, NASA's proposed fiscal year 1984 budget fully supports a four-orbiter fleet, with enough structural and subsystem spares to make certain that the fleet is able to survive serious delays or accidents. Our proposal will also reduce the lead time for replacement of an orbiter if an operational demand requires it.

A new observation satellite, Landsat–4, was placed in Earth orbit in July 1982. We are particularly pleased with the images provided by the satellite's new Thematic Mapper. Although an anomaly occurred disrupting direct readout of Thematic Mapper data, this data will continue to be available when TDRS becomes operational. Landsat–4 is also experiencing solar array power intermittence which is reducing the available spacecraft power. If the latter problem does not worsen, no significant mission impact will result. Additionally, our Earth-orbiting scientific satellites and other spacecraft in the solar system have continued to operate and return extremely valuable scientific information; and in aeronautics, two large new aeronautical research facilities are nearing completion at the Ames and Langley Research Centers.

ADMINISTRATION COMMITMENT TO SPACE PROGRAM

I would now like to turn to another achievement, a renewed commitment to the American space program from President Reagan who on July 4, 1982, issued a policy statement which outlines basic U.S. goals for activities in space, one of which was to maintain U.S. space leadership. The key to leadership in space is to have efficient and effective ways of getting there. The President's space policy strongly supports the Space Shuttle program, calling the Shuttle, "The primary space launch system for both U.S. national security and civil government missions."

NASA's first priority, Mr. Chairman, remains to make the Space Shuttle system fully operational as rapidly as possible and to explore new ways of employing the full capability of the Shuttle. Later this year, we are scheduled to fly the first Spacelab mission which has a twofold importance: (1) Demonstration of the new capabilities of the Space Shuttle; and (2) representation of international cooperation consistent with the President's space policy.

The NASA fiscal year 1984 budget request provides continued support for development of the Space Telescope which will be the most important scientific instrument we have ever flown. As you know, Mr. Chairman, the program is experiencing significant technical problems, which have been the subject of several recent indepth reviews. Our preliminary assessment is an increase of at least $200 million in the estimated runout cost and a launch slip of at least 1 year. Major changes are being implemented in systems management to help minimize cost and schedule risks. We will have a revised program plan shortly together with a request for committee approval of fiscal year 1983 funding augmentations, as appropriate.

NEW INITIATIVES

We have included in the proposed fiscal year 1984 budget the initiation of a new program to map the surface of the planet Venus using radar-imaging techniques. This initiative—the Venus Radar Mapper (VRM)—replaces, at a much lower cost, the previously approved Venus Orbiting Imaging Radar (VOIR) mission. Another new fiscal year 1984 proposed initiative, the Advanced Communications Technology Satellite (ACTS), calls for development and flight testing of the high-risk technology needed to insure continued U.S. preeminence in the field of satellite communications. The ACTS program procurement approach includes a cost/risk sharing arrangement with industry which will provide significant cost savings to the Government.

In pursuit of a further goal of the President's space policy to expand private sector investment and involvement in space activities, NASA has received and will review proposals from the private sector to fund and/or operate launch vehicles.

The administration also has developed a new policy statement governing the needs for and management of federally funded research and development work in aeronautics. In concert with this policy, we are submitting a fiscal year 1984 budget request which continues to emphasize a strong aeronautical research and technology program. The centerpiece of the budget request is the new Numerical Aerodynamic Simulation (NAS) activity, which will be developed over the course of the next few years. The NAS capability will include a large computer system which will make it possible to perform most of the calculations required to design new aircraft. NAS will provide us with sufficient accuracy and reliability to significantly reduce the long and expensive process of wind tunnel and flight testing now necessary.

Mr. Chairman, you may be aware that considerable interest has been expressed by the historical preservation community, as well as Members of Congress, with regard to the preservation of the Launch Umbilical Tower (LUT), utilized at KSC for the Apollo launches. In response to this interest and in a spirit of cooperation, NASA included in its agreement with the contractor carrying out the LUT disassembly an option to disassemble the LUT in a manner which would preserve the tower for possible future assembly as a visitor attraction. The cost of this preservation option is approximately $1.8 million. NASA was sued on April 20, 1983, by the National Trust for Historic Preservation to guarantee the preservation of the tower and a hearing on a preliminary injunction is scheduled for May 9. You should be aware, Mr. Chairman, that if NASA were to take down the LUT so that it could be subsequently reassembled, the cost of reassembly has been estimated at an additional $8 to $10 million.

CONSTRUCTION OF FACILITIES INCREASE

In the fiscal year 1984 budget request before you, there is a substantial increase in funding for construction of facilities—$150 million as compared to approximately $100 million in fiscal year 1983. A significant increase is required to adequately maintain and preserve our valuable physical plant. This area has suffered severe shortfalls in recent years due to budget limitations. We are also proposing the maintenance of the same number of civil service positions in fiscal year 1984 as we have in fiscal year 1983.

IMPORTANCE OF NEW CONCEPTS

I would be remiss, Mr. Chairman, if I did not conclude my testimony by talking about the future. The President's space policy recognizes the importance of developing new concepts which will provide a strong vision of the future, not only for our space program, but for the Nation as a whole. NASA's proposed fiscal year 1984 budget includes modest funding for space station definition and planning studies which will allow us to understand in greater detail how such permanent facilities might be developed and maintained in Earth orbit.

Mr. Chairman, having discussed some of the important highlights, I would be happy to answer any questions you and other members of the subcommittee might have. In the interest of time, I have submitted my prepared statement for inclusion in the hearing record.

Senator GARN. Thank you very much.

[The statement follows:]

STATEMENT OF JAMES M. BEGGS, ADMINISTRATOR

Mr. Chairman and Members of the Committee:

It is a pleasure for me to appear before this distinguished Committee to present President Reagan's budget request for NASA for Fiscal Year 1984. The total request is $7.1 billion, of which $5.7 billion is contained in the account labeled Research and Development which also includes certain operational funding, $150 million for Construction of Facilities, and $1.25 billion for Research and Program Management. A chart summarizing NASA's FY 1984 request is appended to this statement.

I am particularly proud to be at NASA in 1983 to celebrate its 25th Anniversary. During the 25 years since the United States entered the Space Age, our space program has grown from the 14 kg Explorer, launched in January 1958, to a truly reusable Space Transportation System.

With your permission, Mr. Chairman, I would like to spend a few minutes discussing some of the achievements of the past year -- achievements which have been very significant, indeed, and which would not have been possible without the strong and continued support of the Congress. In 1982, the Space Shuttle Orbiter Columbia made three successful orbital flights and, during each flight, significant progress was made in understanding the operational features of the Shuttle system. This initial phase of the STS flight program culminated with the first operational flight in November 1982, during which two commercial communications satellites were launched. There is no doubt in my mind, Mr. Chairman, that the investment this Nation has made in the Space Shuttle will pay off handsomely. We now know enough about the system so that I can make this statement with great confidence.

As you know, a new Earth observation satellite, Landsat 4, was placed in Earth orbit in July 1982, and its operations have been spectacularly successful, until two recent anomalies occurred recently. The first anomaly disrupted direct readout of thematic mapper data through the spacecraft's X-band communication link. This link was to have transmitted thematic mapper data directly to the ground before the TDRSS becomes operational. Thematic mapper information will be once again available when the TDRSS becomes operational. The second anomaly is a solar array power intermittence which is reducing the available spacecraft power. If the latter problem does not worsen, no significant mission impact will result. The satellite's new Thematic Mapper has provided information of a quality exceeding the original specifications, including valuable information for the geophysical sciences as well as excellent data for mapping and Earth resources assessment. Additionally, our Earth orbiting scientific satellites and other spacecraft in the solar system have continued to operate and to return extremely valuable scientific information.

In aeronautics, the Department of Defense has recognized the importance of NASA's technical contributions by considering NASA's tilt-rotor aircraft concept as a prime contender for the new joint service JVX vertical take-off and landing aircraft program. The XV-15 experimental aircraft, jointly developed by the Army and NASA, served as the proof-of-concept vehicle which made this recognition possible. Two large new aeronautical facilities are nearing completion, the National Transonic Facility at Langley Research Center and the new 80x120 foot addition to the 40x80 foot Subsonic Wind Tunnel at Ames Research Center. The completion of operational test and checkout of the new 80x120 foot leg has recently suffered a set-back because of an accident during testing. The facility is expected to be operational in about two years. NASA hopes to repair the facility and return it to operation as soon as possible to minimize delays to a number of priority NASA, DOD, and industry testing programs.

This is just a brief overview of some of the technical achievements of 1982--the list is really much longer. I will talk in more detail about some of the things that have been accomplished later on.

I would now like to turn to another achievement, a renewed commitment to the American space program from the highest levels of this Administration. On July 4, 1982, President Reagan issued a policy statement which outlines basic U.S. goals for activities in space. These goals are:

o to strengthen the security of the United States;

o to maintain United States space leadership;

o to obtain economical and scientific benefits through the exploitation of space;

o to expand United States private sector investment and involvement in civil space and space related activities;

o to promote international cooperative activities in the national interest; and, finally,

- to cooperate with other nations in maintaining freedom of space for activities which enhance the security and welfare of mankind.

The NASA budget request for FY 1984, which I am addressing today, is designed to achieve the objectives outlined in President Reagan's space policy--especially the maintenance of United States leadership in space. This is really the important word--leadership--and this Committee may rest assured that the Administration is strongly committed to what that word represents.

The key to leadership in space is to have efficient and effective ways of getting there. The President's space policy strongly supports the Space Shuttle program, and calls the Shuttle "the primary space launch system for both United States national security and civil government missions."

NASA's proposed FY 1984 budget fully supports a four-orbiter fleet, with enough structural and subsystem spares to make certain that the fleet is able to survive serious delays or accidents. Our proposal will also reduce the lead time for expansion or replacement of the four-orbiter fleet, if and when operational demands require. Our plans make it possible to meet the commitment to launch the payloads which we, and those depending upon us, have planned for at least the remainder of this decade. NASA's first priority, Mr. Chairman, remains: to make the Space Shuttle System fully operational as rapidly as possible. Additionally, we will continue to explore new ways of employing the full capability of the Shuttle. The proposed FY 1984 request continues funding of activities leading to a Shuttle mission to recover and repair on orbit the partially defunct Solar Maximum Mission (SMM) spacecraft in 1984. This will provide more useful life for the important SMM objectives and demonstrate the Shuttle's ability to perform such operations. Later on this year, we are scheduled to fly the first Spacelab mission which is an important demonstration of the new capabilities represented by the Space Shuttle. The Spacelab, developed and contributed by the European Space Agency, represents an important international activity consistent with the President's space policy.

Another international contribution to the Space Shuttle Program is the Remote Manipulator System (RMS) which was provided by the Government of Canada. The RMS successfully completed testing last year and in November was declared ready for operational use aboard future Shuttle flights.

NASA policy has recently been revised to expand opportunities for sponsors of Shuttle payloads to nominate payload specialists to fly with them. President Reagan invited a Brazilian payload specialist to fly aboard the Shuttle, and during his recent discussions with the Prime Minister of Japan, he extended a similar offer which was accepted. Australia and Canada have also accepted invitations for payload specialist nominations.

The second United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE '82), held in Vienna last August, helped to promote greater international awareness of the practical benefits of the applications of space science and technology.

In my testimony before this Committee last year, I said that the Space Telescope will be the most important scientific instrument we have ever flown. I continue to believe this is true, and NASA's FY 1984 budget request provides priority support to this very important development effort.

As might be expected in a program of this complexity, we are continuing to experience technical problems, particularly in the Optical Telescope Assembly development activities, which will impact the scheduled launch and runout cost of the Space Telescope. The program has been undergoing an intensive Agency review, and as a result, major changes are being implemented in the systems management and technical approach to help minimize the cost and schedule risks. An assessment of the exact cost and schedule impact will not be known until later this year; however, our preliminary assessment is an increase of at least $200 million to the estimated runout cost and a launch slip of at least one year.

Excellent progress is being made in other areas related to the Space Telescope. In a few months, we will open the doors of the new Space Telescope Science Institute which has been established at the Johns Hopkins University. Software and procedures for carrying out scientific investigations with this very complex space observatory are on schedule.

It is difficult to overemphasize the importance of the Space Telescope to the science of astronomy. This program represents a quantum lead in observational capability comparable only to the invention of the telescope by Galileo. The technical content of the project represents a challenge unequalled by any other unmanned space program. For this reason, the Space Telescope has a high priority ranking second only to the Space Shuttle.

Another measure of leadership in space is the continuing enterprise of planetary exploration. We have included in the proposed FY 1984 budget the initiation of a new program to map the surface of the planet Venus using radar imaging techniques. Within our overall strategy for planetary exploration, this initiative -- the Venus Radar Mapper (VRM), estimated to cost in the $350 million range -- replaces, at a much lower cost, the Venus Orbiting Imaging Radar (VOIR) mission authorized by the Congress to begin in FY 1982. The VRM mission will help us understand why our sister planet, Venus, which is so much like the Earth in size and physical composition, yet so different in other respects, has followed such a different evolutionary history. We will search for detailed properties in common with the Earth, such as volcanic activity and continental drift. Aside from their intrinsic scientific value, observations provided by the VRM will help us to understand more clearly the history, nature, and most importantly, the future of our own planet.

The Advanced Communications Technology Satellite (ACTS) project, another new initiative proposed in the FY 1984 budget, calls for development and flight testing of the high-risk technology needed to ensure continued United States preeminence in the field of satellite communications. The decision to propose the ACTS program is a result of extensive consultation with communication carriers, satellite system suppliers, and strong support from the Congress. The ACTS program will involve a novel procurement approach, including a cost/risk sharing arrangement with industry which will provide significant cost savings to the Government.

Another goal of the President's space policy is to expand private sector investment and involvement in space activities. NASA has received proposals from the private sector to fund and/or operate launch vehicles. We are reviewing these proposals very carefully to determine costs and benefits, launch and tracking requirements, safety and security, as well as international considerations.

In addition to the President's space policy which I have already discussed, the Administration has developed a new policy statement governing the needs for and management of Federally funded research and development work in aeronautics. In November 1982, the President's Office of Science and Technology Policy released a document entitled, "Aeronautical Research and Technology Policy." The aeronautics program included in NASA's FY 1984 budget request reflects many recommendations contained in this important policy statement. The most important facet of the Administration's new aeronautics policy is the recognition that a strong aeronautical industry is absolutely essential for both the National security and the health of our economy. Furthermore, this policy recognizes explicitly the important role the Federal Government, through NASA, plays in providing the basic technology which will assist the United States in maintaining and enhancing the leading position in aviation which we now enjoy. In concert with this policy, we are submitting an FY 1984 budget request which continues to emphasize a strong aeronautical research and technology program, including a strengthened fundamental research program which will continue to provide the technical base upon which future aircraft designs can be based.

. The centerpiece of our proposed aeronautics program for FY 1984 is the new Numerical Aerodynamic Simulation (NAS) activity, which will be developed over the course of the next few years. The NAS capability will include a large computer system which will make it possible to perform most of the calculations required to design a new aircraft with sufficient accuracy and reliability to significantly reduce the long and expensive process of wind tunnel and flight testing now necessary. There is every reason to believe that the computer technology to achieve this objective can be developed in the next few years, and there is no question that the capability the NAS represents will make it possible to design new airplanes much more effectively. The investment made in NAS will provide incentives for various elements of the computer industry to produce machines which will be able to take advantage of major commercial applications. Developments of this kind will enhance the competitive posture of the United States in this important international market.

The FY 1984 budget proposed by the Administration also contains a number of items which are very important to the future of NASA's health as an institution. It is clear that the achievements I have outlined earlier in my testimony would not have been possible without a strong NASA institution. In the FY 1984 budget before you, there is a substantial increase in funding for Construction of Facilities--$150 million as compared to approximately $100 million in FY 1983. We are also proposing the maintenance of the same number of civil service positions in FY 1984 as we have in FY 1983. The maintenance of our civil service strength is particularly significant because this manpower level will afford an opportunity for NASA to hire some of the best recent graduates of the foremost science and engineering schools in the Nation. We plan to take aggressive steps to bring in the best people we can find in order to strengthen NASA's institution for the long term.

In the past year, Mr. Chairman, concern has been expressed in the press and in the Congress about the appropriate relationship between NASA and those elements of the National security establishment with responsibility for space operations. I would like to take this opportunity to state categorically that this Administration is strongly committed to separate space programs, one dealing with civil sector operations and the other with those related to the national security. The President's space policy is very clear on this point, stating that, "The United States space program will be comprised of two separate, distinct, and strongly interacting programs--National security and civil. Close coordination, cooperation, and information exchange will be maintained among these programs to avoid unnecessary duplication." We have continued to maintain separate programs and to have separate policies governing these programs; but we have also developed a number of new interactive relationships which promote efficient coordination and management while protecting the integrity of NASA programs. We have just finalized a renegotiated Shuttle pricing agreement with the Department of Defense. This new agreement will provide NASA with increased reimbursements of approximately $1 billion more in the next five years than the Agency would have received under the previous policy agreed to in 1977. This revised policy will raise the Shuttle launch cost to DOD by almost 150 percent, in FY 1975 dollars, above the previously set launch price. We also have several Memoranda of Understanding with the Department of Defense which deal with various aspects of programs in order to avoid the unnecessary duplication which the President mentions in his space policy.

I would be remiss, Mr. Chairman, if I did not conclude this portion of my testimony by talking about the future. The President's space policy recognizes the importance of developing new concepts which provide a strong vision of the future, not only for our space program, but for the Nation as a whole. In his space policy, the President requires NASA to "continue to explore the requirements, operational concepts, and technology associated with permanent space facilities." The Space Shuttle makes it easier to establish larger permanent facilities in space. NASA's proposed FY 1984 budget includes modest funding for definition and planning efforts which will allow us to understand, in greater detail, how such permanent facilities might be developed and maintained in Earth orbit. These studies will provide a basis for considering possible future proposals to establish a permanent manned station in Earth orbit.

I should stress that we are not now proposing to develop such a space station, but we believe that it is important to understand the uses to which such a capability could be put. We have every reason to believe, Mr. Chairman, that the Soviet Union has learned a good deal about manned operations in space from their experiences with Salyut 6 and Salyut 7. There is also evidence that the Soviets are planning more extensive activities in Earth orbit, and we must understand potential benefits of such operations. It is important for the United States to take the necessary steps now to achieve these objectives.

Mr. Chairman, having discussed some of the important highlights, I would now like to proceed with a more detailed discussion of NASA's proposed FY 1984 program.

SPACE TRANSPORTATION

For FY 1984, the Space Transportation request is $3.498 billion. This includes $1.927 billion for Space Transportation Capability Development and $1.571 billion for Space Transportation Operations.

Since the budget hearings of last year the Space Transportation System has continued to mature. The Space Shuttle Orbiter Columbia made three flights in 1982, completing the Orbital Flight Test Program and initiating the transition into a fully operational system. STS-3 carried the first space science pallet of instruments and demonstrated the practical use of the Remote Manipulator System. STS-4 carried the first DOD payload; and STS-5, the first operational flight, demonstrated a number of "firsts." It was the first time the Shuttle's main engines were run above their rated power level (100 percent) during ascent; the first four man crew; and the first launch of commercial payloads, Telesat-E and SBS-C. STS-5 also carried a getaway canister, four student experiments and a joint endeavor experiment with McDonnell Douglas Corporation, to investigate the commerical potential of separating biological materials in space using a continous flow electrophoresis device. The success of the STS-5 contributed immensely to our image of having an operational system and demonstrated our ability to deliver commercial payloads.

The launch of Challenger (STS-6) was delayed from its original planned launch date of January 28, 1983, to April 4, 1983. The delay resulted from the discovery of several small leaks in the Shuttle main engines and some contamination of the TDRSS payload. The leaks were repaired on the engines and the TDRSS payload was cleaned and inspected prior to the launch. We are building on the experience of this delay to develop operational tests and procedures to insure that future flights will not be subject to this type of delay.

STS-6 was launched at 1:30 p.m. EST on April 4, 1983, at KSC from Launch Pad 39A using the MLP-2 for the first time and landed five days later at Edwards Air Force Base. The flight crew was Paul J. Weitz, Commander, Karol J. Bobko, Pilot, and Story Musgrave and Donald H. Peterson, Mission Specialists. The latter two of whom performed the first U.S. Extra Vehicular Activities (EVA) in 9 years which proved the flight crews and EVA equipmment systems where compatible. The performance of Challenger, including the repaired main engines, was excellent. The mission met its operational and test objectives which included deployment of the Tracking and Data Relay Satellite (TDRS-A/IUS). As a result of an anomaly during the IUS second stage burn, the TDRS-A was deployed in an elliptical orbit of 13,566sm by 21,977sm and was tumbling at approximately 30rpm. Contact was regained by the White Sands ground station, and the spacecraft was stabilized. The solar arrays and antennas were successfully deployed. A plan is under development to correct the orbit to the geosynchronous altitude of 22,300sm. These maneuvers will be initiated in early May. The second TDRS spacecraft is scheduled for launch later this year.

The Space Transportation Capability Development Program provides for the National fleet of Space Shuttle orbiters, including main engines, and provides for the launch site and mission operations control requirements, initial spares, production tooling and related activities to meet the needs of NASA, the DOD, and other domestic and international users of space. In addition, this program includes upper stages, Spacelab and advanced programs requirements. In 1983, the third orbiter OV-103, will be delivered for the first operational flight in early 1984. The FY 1984 budget will also allow for completion of the final assembly and integrated testing of OV-104, leading to a delivery at the end of 1984, and the acquisition or orbiter structural spares to support the existing orbiter fleet.

The FY 1984 budget will extend the Shuttle processing and launch capability with the continuing preparations for activating the second launch pad, initial construction funds for the third mobile launcher platform, and modifications to Pads-A and-B to make them Centaur-compatible.

In the upper stages programs, funds are requested to continue the development of Centaur-G, in cooperation with DOD, and Centaur-G prime to support the Galileo and ISPM launches in 1986. We also plan to use the Centaur-G to launch the Venus Radar Mapper in 1988. The budget allows for completion of the IUS vehicles to support four planned TDRSS launches.

The first Spacelab flight is scheduled for 1983. FY 1984 funds will support post-flight data analysis, and integration and checkout for the second Spacelab verification flight scheduled for FY 1985. Funding is also provided for payload support to the Spacelab 2 and Spacelab 3 missions, Galileo, ISPM, Space Telescope, and the SMM retrieval/repair mission.

In FY 1984, the major emphasis in Space Transportation advanced programs will be to define the system architecture and system elements for possible space operations over the next 20 years. Funding will provide for studies of Earth-orbital platforms and facilities; orbital services such as satellite servicing; and advanced transportation concepts for reusable upper stages, teleoperated maneuvering vehicles and Shuttle derived Earth-to-orbit launch vehicle systems. FY 1984 funding will also provide for the initiation of hardware development of the Tethered Satellite System, a cooperative project with Italy. The Italians will develop the spacecraft and the U.S. will develop the deployment mechanisms and will be responsible for the program management and integration with the orbiter.

The Space Transportation Operations Program provides the standard operational support services for both of the primary U.S. Government space launch systems -- the Space Shuttle and the expendable launch vehicles. The budget for FY 1984 will provide for production of Shuttle flight hardware (external tanks, solid rocket boosters, engine spares and orbiter spares); maintenance and operation of mission control and crew training systems; and the manpower necessary to support the launches planned for FY 1984. Ten sets of SRB hardware and 11 external tanks are scheduled for delivery in FY 1984.

In November, we awarded a base operations contract for NASA's Kennedy Space Center, to EG&G, Inc., aimed at strengthening support of our launch functions. Under this contract, there will be a clear assignment of responsibility and accountability and a reduction of management interfaces from fourteen to one. In late 1983, we expect to award a Shuttle processing contract which will further reduce the program management complexity and operational costs. The initial start up costs and projected manpower savings are reflected in the FY 1984 estimates. Later, we hope to issue a cargo processing contract to complete the consolidation of our efforts.

We have also taken steps to reduce production costs and increase launch capability. A significant milestone was reached last September when we took delivery of the first lightweight external tank five days ahead of a schedule set in 1980. Our goal was to reduce 6,000 pounds from the previous tank configuration and we actually achieved a 10,000 pound reduction. An additional improvement in payload capability of approximately 5,500 pounds is expected from the new filament wound case, for the solid rocket booster, which is planned for first use in late 1985. Programs are also underway to reduce recurring external tank and solid rocket booster production costs, include modification to the aft skirt structure, modifications in applying and removing tank TPS and development, of low cost solid rocket motor nozzle material.

In the Expendable Launch Vehicles program, the FY 1984 funding reflects the requirements to support the Delta launch vehicle's missions. We have recently determined that the number of vehicles to be procured for non-NASA missions should be reduced commensurate with the revised reimbursable launch requirements. The Delta system is planned to be operational at least until 1986 to support the launch requirements of the National Oceanic and Atmospheric Administration.

SPACE STATION PLANNING ACTIVITIES

Last May, I established a Space Station Task Force to provide focus and direction to the Agency's planning activities for this potential major new initiative. The planning effort will be continued and expanded modestly in FY 1984 in order to generate the information, including costs and benefits, necessary for the Administration and Congress to make an informed decision on whether to proceed with some form of more permanent space facilities.

NASA's FY 1983 planning activity is focused upon understanding exactly what a space station could do, emphasizing the several areas of endeavor that utilize space: science, applications, technology development, National security, and commerce. We have deliberately steered away from design and configuration, directing our attention, and that of other interested parties, to mission requirements and "architecture." Our goal is to have a thorough understanding of space station functions and the consequent attributes a station would require to carry out specific missions. Last summer, we sponsored eight small industry studies of potential space station missions. These have recently been completed. Their results will be synthesized into potential time-phased mission sets which could be accomplished by a station in space. In addition, we have held discussions with our scientific and technical advisory committees, potential international partners and the Department of Defense to encourage them to review space station missions.

NASA's FY 1984 request includes $6 million within Space Transportation Advanced Programs which will be used primarily for space station systems engineering activities. An additional $6 million is included to augment on-going efforts in the FY 1984 Space Research and Technology program, principally to focus on key technology activities. In addition, $2 million is requested in the Space Science and Applications program primarily for studies of science and applications payloads applicable to a space station. FY 1984 planning calls for identification of an "architecture" which could accommodate a preferred mission set, and further refinement of conceptual approaches.

SPACE SCIENCE AND APPLICATIONS

The past year's highlights for the Space Science and Applications program, in addition to the Landsat 4 launch, include the recent launch of the Infrared Astronomy Satellite (IRAS), and the outstanding early success of the Search and Rescue Satellite project.

Landsat 4 was launched in July, to provide more sophisticated and reliable data on Earth resources. Landsat 4 carries a flight-proven Multispectral Scanner (MSS) and Thematic Mapper (TM) instruments for remote sensing. Data from these instruments have surpassed all expectations. The improved ground resolution and extended spectral range provided by the Thematic Mapper will enable users to recognize subtle differences in forest species, agricultural conditions, soil moisture and water turbidity that could not be detected in earlier MSS imaging. Approximately 4,000 TM scenes of the continental United States have already been acquired and archived during the first six months of Landsat 4 operations, and several research programs are now underway to evaluate in detail the quality and scientific utility of the Landsat 4 imagery. Unfortunately, anomalies have occurred disrupting direct readout of thematic mapper data directly to the ground and a reduction of the spacecraft's power supply. In the event we are unable to correct the communications problem, information will be available once again when the TDRSS becomes operational. At this time no significant mission impact is anticipated relative to the solar array anomaly.

IRAS, an extremely difficult and technologically challenging mission, developed in cooperation with the Netherlands and the United Kingdom, will execute the first comprehensive survey of the infrared sky, providing a new window to the universe. It is expected to revolutionize astronomy in the same way that the first ultraviolet and x-ray satellites did in the last two decades.

The Search and Rescue Satellite project, another significant international cooperative endeavor, began system checkout in September, and demonstrated its effectiveness almost immediately when a small aircraft which had crashed in a remote region in British Columbia was detected by the system. The injured pilot and two passengers were rescued. By mid-April, the new system was credited with saving more than 30 lives in aircraft and marine distresses in the United States, Canada, and Western Europe using the COSPAS I satellite. The second Soviet spacecraft was launched on March 25 and the first SARSAT spacecraft -- NOAA-E -- was launched on March 28, 1983. These new spacecraft bring the on-orbit complement to three and will even more significantly enhance the performance of the system.

Our FY 1984 budget request of $1068.0 million for Space Science and Applications supports the two new initiatives I mentioned earlier -- the Venus Radar Mapper and the Advanced Communications Technology Satellite -- and will enable us to pursue a vigorous program. The proposed budget supports the completion of the Landsat-D' spacecraft; it continues priority support for the Space Telescope development. As indicated earlier in my statement, we have initiated an indepth review of the Space Telescope project, which will lead to a revised schedule and runout cost estimate. The FY 1984 budget also continues Galileo development leading to a single Shuttle/Centaur launch in 1986; and it continues International Solar Polar Mission (ISPM) instrument development leading to a launch in 1986. It continues the hardware development of the Gamma Ray Observatory (GRO) leading to a launch in 1988. It supports a 1984 launch for the Earth Radiation Budget Experiment (ERBE); technology development and analysis of flight experiments in Materials Processing; operation of the Pioneer Venus Orbiter, Pioneers 6 through 11, and Voyagers 1 and 2; support for the Infrared Telescope Facility and the Lunar Curatorial Facility; and continued development of experiments to understand the effects of weightlessness on man.

The Explorer development funding level is somewhat higher than in FY 1983 because this program offers important opportunities to address key space science questions in a highly cost effective manner. The FY 1984 funds will be utilized to complete development of the Active Magnetospheric Particle Tracer Explorer (AMPTE), a project to determine how particles from the solar wind enter the Earth's magnetosphere; will support development activities for the Cosmic Background Explorer (COBE) satellite; and will support initiation of the Extreme Ultraviolet Explorer (EUVE), which is expected to reveal new information on the structure and composition of interstellar media.

This proposed Space Science and Applications budget represents a commitment to maintain the momentum in scientific and technical excellence that has had such an important impact on the Nation and the world. It will continue the outstanding effort of the past, initiate new activities, and assure the preservation of the scientific research base that is critical to United States leadership in space.

TECHNOLOGY UTILIZATION

For FY 1984, we are requesting $4 million for Technology Utilization to continue the transfer of NASA-developed technology to U.S. industry, the public and other Government agencies. We have two primary program objectives: 1) to target applications engineering efforts to increase productivity in U.S. manufacturing industries, and 2) to improve the quality of life and workforce through bioengineering and rehabilitation projects. We intend to enhance public sector technology applications projects in conjunction with other mission-oriented Federal agencies and industry with a view toward shifting budgetary responsibility for resultant projects to those entities.

AERONAUTICAL RESEARCH AND TECHNOLOGY

In FY 1984, a total of $300.3 million is requested for NASA's Research and Technology program, to provide the technology advances essential to the continued U.S. leadership in aeronautics. A strong base of technology is needed to develop future U.S. aircraft which will enhance our competitive position in the world aviation marketplace, and to provide continued superiority of the Nation's military aircraft. NASA's FY 1984 budget request continues to emphasize a strong fundamental research and technology base of activities as well as focused systems research activities, and constitutes a balanced effort in response to the Administration's recently enunciated aeronautics policy.

In FY 1984, emphasis in fluid and thermal physics will be applied to turbulent drag reduction, internal computational fluid dynamics, and high Reynolds number cryogenic testing to be provided by the National Transonic Facility at NASA'S Langley Research Center. This facility, which will become operational in June 1983, will provide the most advanced transonic speed test capability in the world. Using models of the world's most advanced aircraft, this facility will allow near exact simulation of flight conditions. Areas of emphasis in materials and structures will include ceramics, new composite materials, and transport crash dynamics. In controls and human factors, new research capabilities will be provided by the Man-Vehicle Systems Research Facility at the Ames Research Center and the Avionics Integration Research Laboratory at the Langley Research Center. The upgrading of capabilities in computer science and applications will continue to receive major emphasis, with expanded efforts directed toward technology for fault tolerant systems. In propulsion, emphasis will be placed on intermittent combustion engines, helicopter and turboprop transmissions, engine dynamics and stall recovery, and small radial turbomachinery. Rotorcraft research will stress noise and vibration reduction and the unsteady aerodynamics of rotors. Research will also be conducted to investigate guidance and control for all-weather rotorcraft operations, composite tilt rotor blades and technologies aimed at improving performance and flying qualities of the tilt rotor vehicle class. Areas of emphasis in high-performance aircraft research will include supersonic cruise technology, hypersonic propulsion, structures, configuration aerodynamics, and propulsion/airframe integration. Also included will be flight evaluations of advanced concepts using special F-16 and F-111 aircraft to investigate new technologies for enhancement of fighter performance. The proof-of-concept flight research phase of the NASA/Defense Advanced Research Projects Agency (DARPA) X-29A forward swept wing vehicle will begin, and increased effort will be provided in the Turbine Engine Hot Section Technology program to study means for increasing engine performance and durability. In subsonic aircraft, research emphasis will be placed on commuter aircraft technology, icing and lightning research, natural laminar flow, and problem areas identified in coordination with the Federal Aviation Administration as critical to improved air safety and operations.

In FY 1984, program augmentations are planned in the important long-lead, high-risk technology areas: numerical aerodynamic simulation, large composite structures, and rotorcraft. The Numerical Aerodynamic Simulation initiative will significantly augment the

Nation's program in computational fluid dynamics and other areas of computational physics. It will provide advanced capability for users nationwide for computational aerodynamics, computational chemistry, and other complex analytical problems. Advanced composite structures technology will address thick, load-critical primary structures representative of large aircraft wing-structure sections; curved panels to investigate fuselage design technology problems; and new generation materials for increased toughness and impact resistance. Technology for next-generation rotorcraft will pursue further understanding relative to two high-speed rotorcraft concepts -- the advanced tilt rotor technology and the DARPA X-wing utilizing NASA's Rotor Systems Research Aircraft.

SPACE RESEARCH AND TECHNOLOGY

NASA's FY 1984 Space Research and Technology request of $138 million will focus on providing advanced technology in support of NASA's role of maintaining the U.S. preeminence in space. This investment in research and technology is essential for improving operational capability, reliability, and affordability of existing and planned NASA missions, as well as providing the technology base and technology options for rapidly expanding military and commercial space interests.

The FY 1984 budget continues to emphasize a strong Research and Technology (R&T) base of activities in the discipline areas of fluid and thermal physics, chemical propulsion, materials and structures, computer science and electronics, space energy conversion, controls and human factors, and space data and communications. The computer science and space human factors disciplinary activities represent new elements in the R&T base that respond to important future systems needs, as well as to identifiable, high-leverage, technological advancements. In addition, activities in spacecraft, transportation, and platform systems research are designed to study the inter-relationships of discipline technology from an integrated systems point of view. These efforts are critical to the successful transition of technology from the laboratory to useful application. It is encouraging that a cooperative program around NASA, DARPA and DOE on space nuclear power technology was reached and a Memorandum of Understanding was signed on February 11, 1983. In FY 1984, a modest expansion to the base program in platform systems is planned to investigate technology options that could enhance capabilities and growth potential of permanent space facilities.

The Systems Technology effort in FY 1984 will focus on the following technology missions or experiments: launch of the long-duration exposure facility, the solar array flight experiment, solar cell calibration facility, tribology experiment, reflight of the feature identification and location experiment, launch of the ion auxiliary propulsion system, design activity on a space technology experiment platform, and a cryogenic fluid management facility.

ENERGY TECHNOLOGY

During the past year, NASA has continued to support the Department of Energy (DOE) and other agencies in energy research and technology development. Important progress was made by NASA's Lewis Research Center in advancing ceramic component technology for the automotive gas turbine, and in improving the life and performance of advanced phosphoric acid fuel cell systems.

In FY 1984, NASA will continue to support those energy programs which were initiated in prior years, and which the DOE or other sponsoring agencies desire NASA to continue. We intend to complete our previous commitments as efficiently as possible to ensure the integrity of the Government investment made to date. For the future, it will be our policy to concentrate on energy programs which have objectives which are synergistic with NASA's aeronautics and space programs.

SPACE TRACKING AND DATA SYSTEMS

For the Space Tracking and Data Systems program in FY 1984, NASA is requesting a total of $700.2 million, which includes $294.7 million for acquisition of service via the Tracking and Data Relay Satellite System (TDRSS) as well as support of TDRSS related elements. This request provides for the continuation of the vital tracking, command telemetry and data acquisition support to meet the requirements for all NASA flight programs.

The Spaceflight Tracking and Data Network (STDN) and the Deep Space Network (DSN) will continue to provide support to both near-Earth orbiting satellites, including the Space Shuttle operational flights and deep space probes. In FY 1984, numerous applications and scientific Earth-orbiting and planetary missions will be supported.

The TDRSS is planned for full operational capability in 1984, dependent upon solution of the anomaly experienced on TDRS-A. The TDRSS service contract has been restructed to convert the TDRSS from a shared system providing both support of government space missions and commercial communications satellite services, to a system dedicated to providing support to space missions. The FY 1984 budget request reflects the initial full year funding requirements for TDRSS service and the phaseout of most of the STDN ground stations after TDRS is operational. Ground stations planned to be closed, once TDRSS is operational, are Guam, Hawaii, Ascension, Santiago, Dakar, and Botswana, with termination of STS VHF voice communications from Yarragadee, Australia, and the AF Indian Ocean Site. The remaining facilities will then be consolidated with the DSN stations under management of the Jet Propulsion Laboratory (JPL), or dedicated to support of launch and landing operations. The consolidation will result in a single ground network to support geosynchronous, highly elliptical, and all planetary missions.

CONSTRUCTION OF FACILITIES

The Construction of Facilities (CoF) request for FY 1984 totals $150.5 million. Slightly over one-third of the request, $53.3 million, is required for Space Shuttle and payload facilities. The request includes $24 million for aeronautics and space technology activities and $58 million for repair, rehabilitation and modification, minor construction, and facility planning and design. The FY 1984 CoF request strikes an appropriate balance between NASA's need to meet increasing Shuttle flight rates, improve Shuttle manufacturing and processing efficiencies, provide enhancements of existing facilities to afford improved research and testing capabilities, and to repair and preserve our present physical plant.

The Space Shuttle CoF projects are in direct support of achieving a 24-flight-per-year capability. Based on the experience to date, it is NASA's current assessment that two Mobile Launcher Platforms (MLP'S) can support up to 16 flights per year. Thus, the project for modifying a third mobile launcher platform for Shuttle use, at a cost of $27.3 million, is required to reach 24 flights per year from NASA's Kennedy Space Center (KSC). The other large Shuttle- related projects reflected in the request are the construction of a Cargo Hazardous Processing Facility at KSC ($9 million), and some additional modifications to the External Tank (ET) manufacturing facilities ($11.7 million) at the Michoud Assembly Facility in New Orleans.

In the non-Space Shuttle area, our FY 1984 construction request is similar to those of recent years, providing for prudent investments necessary to preserve and improve existing research facility capabilities. An example is the Small Engine Component Testing Facility proposed for construction at NASA's Lewis Research Center. Modification of test cells in the Engine Research Building at LeRC are necessary in order that a critical need for testing and development of small turbine engines can be met. This project is typical of our continuing emphasis on modifying and improving existing facilities to meet new research and technology needs of the country.

Of equal importance is the $58 million requested in FY 1984 for minor facility projects. These are critical to the repair and preservation of an aging physical plant and to ensure that NASA's facilities are capable of meeting today's technology needs.

RESEARCH AND PROGRAM MANAGEMENT

The Research and Program Management request for FY 1984 is $1,247.5 million. About three-fourths of this is required for civil service salaries and related costs. About two percent is for travel which is vital to the management of our R&D programs. The balance is for facility support and related goods and services necessary for the operation of NASA Centers.

The FY 1984 plan provides for a NASA civil service workforce at approximately the present level, the first time in several years that we have not been planning to accomplish some kind of personnel reduction in the current and budget years. Staffing stability of this kind is important for an R&D organization such as NASA. It allows us the opportunity to hire new scientists and engineers to assure the vitality of our technical workforce. It will also enable us to solve minor skill-mix problems that arose in previous years when we were faced with accommodating ceiling reductions. In FY 1983 and 1984 we will be able to plan our hiring in a more effective manner. Although I believe that NASA's workforce is one of the strongest and most creative in the world, we need the influx of people with new viewpoints, different skills, and knowledge of the latest technology in many diverse areas to maintain and improve this outstanding national asset.

The requested R&PM funds will provide for essentially the same level of operations in FY 1984 as planned in FY 1983, considering estimated price levels which are expected to rise at a significantly slower rate than we have experienced in the past years.

As you are aware, the President is very interested in increasing the productivity and improving the quality of all governmental activities. In order to provide leadership in this area and to provide coordination for the many productivity-related activities in both Headquarters and at the Centers, I have formed a steering committee composed of the top management officials of the Agency. The steering Committee is focusing on our overall goals of (1) maintaining NASA as a leader in the development and application of advanced technology and management practices which contribute to significant increases in both Agency and national productivity and quality; (2) identifying areas where NASA practice is behind the state-of-the-art in productivity and quality and to initiate actions to effect improvement; and (3) enhancing awareness among management, the workforce and our contractors of the need to achieve increases in our productivity. We are already moving on some specific productivity initiatives in reducing paperwork throughout the Agency, in introducing common and shared administrative automatic data processing systems and coordinating an Agency-wide plan for information through office automation.

Finally, I am pleased to point out that even with the reductions to our workforce during FY 1982, we continued to improve the representation of minority and female professional employees in the workforce. Last year, the ratio of minority professionals rose from 8.4 percent to 8.7 percent of all professionals. The proportion of females in the professional workforce rose from 11.6 percent to 12.2 percent. Overall, minorities and females now make up 28.7 percent of the total workforce and professional minorities and females make up 18.7 percent of the professional workforce.

CONCLUSION

In conclusion, Mr. Chairman, I believe that NASA's FY 1984 budget request represents a well-balanced program which fully funds the Space Transportation efforts, provides for continuing programs in Science, Applications, and Aeronautics, and reflects several important new Research and Development initiatives. This request also reflects, significantly, an augmented Construction of Facilities program, and a stabilized NASA civil service workforce level. I trust that the Committee will recognize this as a balanced and healthy proposal, which reflects the Administration's commitment to a vital U.S. civilian space program, and that the Committee will fully support NASA's proposed FY 1984 budget.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

BUDGET SUMMARY
(Thousands of Dollars)

	Budget Plan		
	1982	1983	1984
RESEARCH AND DEVELOPMENT			
Space Transportation Systems	3,089,850	3,597,800	3,495,000
Space Science and Applications	896,200	1,034,100	1,068,000
Technology Utilization	8,000	9,000	4,000
Aeronautical Research and Technology	264,800	280,000	300,300
Space Research and Technology	111,000	123,000	138,000
Tracking and Data Acquisition	402,100	498,900	700,200
Total Research and Development	4,771,950	5,542,800	5,708,500
CONSTRUCTION OF FACILITIES	113,700	97,500	150,500
RESEARCH AND PERSONNEL MANAGEMENT	1,134,350	1,199,050	1,247,500
TOTAL	6,020,000	6,839,350	7,106,500
OUTLAYS	6,035,401	6,721,500	6,981,100

NASA ASSISTANCE TO SUBCOMMITTEE

Senator GARN. Before starting the formal questioning, I would like to thank you and your staff for providing assistance to the subcommittee. The subcommittee staff has been asked and assigned responsibility by the full committee of developing a real-time budget analysis system for the entire Appropriations Committee. We appreciate the help that NASA has been to the staff in doing that.

Mr. BEGGS. We are pleased to be able to assist.

Senator GARN. Every year in preparation for our hearings, the committee staff requests that all of the agencies, some 18 of them that come before this committee, submit their opening statements 4 working days before the hearing. Obviously, the purpose of this is to allow us to distribute them to each member of the committee and their staffs so that they can be aware of the content and for the identification of possible question items.

This year, like last, we have not received them prior to the hearing date. All of the other agencies have been able to do that. After all the nice things I said about NASA and their expertise in my opening statement, it rather distresses me that this great agency that I so fully support is the only one of all of the ones that come before this subcommittee that doesn't seem to have the capability to get their statements up here 4 days before the hearings.

Can we anticipate next year that we could have those on time?

Mr. BEGGS. I will lay down the law, Mr. Chairman. Engineers are not so good at writing words.

Senator GARN. I don't know if we can trick you the way I trick my children sometimes, announce the hearing date so they would come up and the hearings will be 4 days later.

TECHNICAL ASSISTANCE TO SMALL BUSINESSES

Recently I was contacted by a small U.S. company which had attempted to bid against several foreign manufacturers on a NASA contract. This company was the only firm that proposed to use U.S. personnel and materials. Although their bid was slightly higher than their two foreign competitors, they were nevertheless judged to be responsive and technically capable.

After listening to their story, I was concerned that NASA might not be doing all that it could to encourage small U.S. companies to successfully compete against foreign manufacturers. In particular, these firms need specific technical guidance as to how to prepare their proposals so that they are responsive from both a technical and cost standpoint.

Could you please provide for the record—you don't need to do it now—a description of what type of technical assistance NASA currently provides to small U.S.-owned businesses and what specific actions you might take in the future to increase the level of assistance provided to them so they can have more of a fair opportunity to compete?

Mr. BEGGS. Yes, sir, I will certainly do that.

[The information follows:]

ASSISTANCE AND GUIDANCE OFFERED TO SMALL BUSINESSES

NASA makes a continuous and concerted effort at all levels of management to insure that the capabilities of small business concerns are actively considered in its procurement program. NASA maintains a Director, Office of Small and Disadvantaged Business Utilization, at the headquarters and a small business specialist at each of the field centers. These specialists assist and advise small business organizations, screen planned procurement programs for participation by small business, maintain qualified source lists of small business concerns, maintain qualified source lists of small business concerns, and provide for the widest possible publicity of pending procurements so that small business may bid for direct awards or as subcontractors. Whenever possible, procurements are set aside for exclusive competition among qualified small businesses.

NASA is an active participant in the Federal procurement conference program sponsored by the Department of Commerce for the predominant purpose of assisting small business. In calendar year 1982, NASA participated in 37 congressionally sponsored business conferences and other business seminars in 15 States with over 25,000 attendees. NASA representatives counsel many of the participants on a one-on-one basis. In addition, there are followups between the NASA representatives and small businesses to assist them in their marketing with the appropriate NASA technical representative. NASA small business specialists at all of the field centers work very closely with the local chambers of commerce and trade associations to inform them of NASA's needs and to aid interested firms in informing NASA of its capabilities and expertise.

Since early 1983, NASA has participated in four regional conferences on the small business innovation research program (Public Law 97-219, enacted July 22, 1982). NASA business and technical representatives took an active part in these conferences which were attended by more than 2,500 persons. One important segment of the conferences was the counseling to assist small technical and scientific firms to learn first hand of NASA's SBIR program to stimulate technical innovation in the private sector.

As a result of Public Law 95-507, NASA requires its larger prime contractors to establish effective small and small disadvantaged subcontracting programs. In all procurements exceeding $500,000, or $1,000,000 in the case of contracts for construction, the successful contractor is required to submit a subcontracting plan for the utilization of small and small disadvantaged business firms. The subcontracting plan shall include, as a minimum, separate percentage goals expressed in terms of percentage of total planned subcontracting dollars for the utilization as subcontractors of small business firms and small disadvantaged firms.

NASA maintains an effective working relationship with the Small Business Administration (SBA) at both the field and the headquarters levels. SBA representatives are invited to review NASA procurements in advance of solicitation to provide additional small business sources and to recommend set-asides when appropriate.

NASA's small business program has shown a marked increase in each of the past few years. It is NASA's intent that it pursue a balanced, comprehensive effort which includes both competitive and set-aside procurement opportunities for small business. This dictates our future involvement in every aspect of the small business program to insure the participation and successful performance of an ever-increasing number of small business firms.

EMPLOYMENT OF SMALL BUSINESSES ENCOURAGED

Mr. BEGGS. I would like to make this comment.

NASA has, in its 25-year history, encouraged the employment of small business in this program. We do, in an average year and the last few years, about $400 million of direct contracting with small business.

Since I arrived on the scene, I have continued to encourage this procurement activity, which as you know is highly decentralized. We do most of our buying out of the eight NASA field centers around the country. I have encouraged them to employ the small business community as much as we can. I am proud of the agency's record. As a matter of fact, given a week or so, I could run into a hearing probably several dozen small businessmen whose firms have prospered and grown as the result of the research that they have done on the NASA program. And, we certainly do want to encourage small business to continue to work with us because I think it is beneficial to us. It certainly is beneficial to the program to be able to point to small business prospering as a result of the work they do with us, and we will do our best to help them enter the program. I will continue to emphasize that.

NASA'S ACCOUNT STRUCTURE

Senator Garn. On January 6, Chairman Boland and I asked OMB to review NASA's appropriations account structure because we were concerned that it no longer accurately reflected NASA's mission. In particular, we noted the growing portion of NASA's budget devoted to Space Shuttle operations. While these activities are currently funded through your R&D account, it obviously is not an R&D activity.

In response to our letter, Mr. Stockman recommended the establishment of a new account for the Shuttle and noted that, "We believe that NASA concurs in this view."

I would like to have your comments on the desirability of establishing such a new account and any qualifications or changes you might recommend.

Mr. Beggs. I think the proposal that Mr. Stockman and the OMB made is a satisfactory one to us. As you know, the budget amounts are growing on the operation side of our budget and that is a concern as well as a problem to us, because with those amounts being carried in the R&D account it makes it appear that the R&D account is much larger than it really is. So I would concur with the idea of establishing the operations account as a line item, so that it can be controlled and accounted for separately.

Senator Garn. Could you supply for the record how you think that account structure should be set up and, in addition, necessary bill language? I think you are best qualified to make those recommendations to us on how it should be handled.

Mr. Beggs. Yes, sir, we will do that.

[The information follows:]

Revised Language and Accounts Structure

Mr. Stockman's letter outlined a revised appropriation structure in which a new account, "Space flight, control, and communications" is to include Space Shuttle production and capability development, space transportation operations (including both Shuttle and expendable launch vehicle operations) and the tracking and data relay satellite system. This approach would be satisfactory and workable.

One change that we would propose to make in this proposed account structure is to include the tracking and data systems ground network and communications and data systems. This would have the advantage, from a management standpoint, of putting all of the tracking and data acquisition operations in the same account.

Attached is revised appropriation language and a revised table of the accounts structure incorporating the above revision.

APPROPRIATION LANGUAGE

1. A new section to follow Research and Development, "Space Flight Control and Communications":

   For necessary expenses, not otherwise provided for; in support of space flight, spacecraft control and communications activities of the National Aeronautics and Space Administration, including operations, production, services, minor construction, maintenance, repair, rehabilitation and modification of real and personal property; tracking and data relay satellite services as authorized by law; purchase, hire, maintenance and operation of other than administrative aircraft, $3,756,600,000, to remain available until expended.
2. Remove from Research and Development the following:

   "tracking and data relay satellite services as authorized by law":
3. Add at the end of "Space Flight, Control, and Data Communications":

   Provided, that up to 10 percent of the amount appropriated for "Research and Development" or "Space Flight, Control and Data Communications" may be transferred to any other NASA appropriation after the Administrator of the National Aeronautics and Space Administration or his designee has notified the Committee on Appropriations of both Houses.

NEW OBLIGATIONAL AUTHORITY

	Fiscal year—		
	1982	1983	1984
Present structure:			
Research and development	$4,771,950	$5,542,800	$5,708,500
Construction of facilities	113,700	97,500	150,500
Research and program management	1,134,055	1,199,100	1,247,500
Total, present structure	6,019,705	6,839,400	7,106,500
Possible revised structure:			
Research and development	2,633,100	1,874,300	1,951,900
Space flight, control, and communications	2,138,850	3,668,500	3,756,600
Shuttle production and capability	(1,282,750)	(1,729,300)	(1,500,000)
Space transportation operations	(466,500)	(1,453,700)	(1,570,600)
Tracking and data acquisition operations	(389,600)	(485,500)	(686,000)
Construction of facilities	113,700	97,500	150,500
Research and program management	1,134,055	1,199,100	1,247,500
Total, possible revised structure	6,019,705	6,839,400	7,106,500

LEGISLATIVE CAPS

Senator GARN. This year, like last year, you are requesting that we remove the specific legislative caps included in your bill language.

Why do you believe that listing upper spending limits for large programs such as the Space Shuttle, Project Galileo, and the Space Telescope should not be included in the committee's legislative language?

Mr. BEGGS. From my view, it is an extra control that you do not need because you already have the control of requiring us to come back for any reprograming. It is an inflexibility that is a concern to us, in terms of our control procedures and we just don't think it is necessary to insure that you have adequate control.

Senator GARN. Does it give you any negotiating leverage with contractors in trying to contain costs?

Mr. BEGGS. Yes, it does. That is the positive side of it. When we get into a situation with our contractors where they are overrunning, we can use the argument that the committees and the Congress have a very close watch on those budgets and have put caps on them, and, if they don't work hard to contain their expenditures, it will have serious consequences—that is the positive side.

INFRARED TELESCOPE FACILITY

Senator GARN. The National Science Foundation maintains the dominant role in supporting ground-based astronomy. Since 1976, the Foundation has provided about 67 percent of all Federal support for this astronomy program. Consistent with this lead role, the committee in its fiscal year 1983 Senate report requested that NASA and the National Science Foundation review the funding arrangements associated with the Infrared Telescope Facility in Hawaii, which up until this time has been funded by NASA.

Before preparing your fiscal year 1984 budget submission, did you consult with NSF to determine the appropriate role of both agencies in supporting this facility.

Mr. BEGGS. Yes, I did. I talked to Dr. Knapp at NSF and we agreed that we would carry it 1 more year; that is into the fiscal year 1984 budget. We also agreed to set up a review group to work this out between ourselves and NSF during this year. That review is ongoing with Mr. Culbertson, who is serving on that review group. We think we will get the issue resolved this year. It continues to be our belief that it is appropriate for NSF to fund the ground-based astronomy and for NASA to sponsor and fund the space-based astronomy.

Senator GARN. Would you report back to the committee by May 26 the pros and cons? We would like to have both sides of the argument on having the Foundation fund it rather than NASA.

Mr. BEGGS. Yes, sir.

[The information follows:]

NASA and NSF are still discussing the funding arrangements associated with the Infrared Telescope Facility in Hawaii. As yet, there has been no final agreement on its disposition. We will keep the committee apprised of the status.

[CLERK'S NOTE: The IRTF agreement was subsequently signed and a copy has been included for the record.]

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION/NATIONAL SCIENCE FOUNDATION

MEMORANDUM OF AGREEMENT ON THE OPERATIONAL SUPPORT OF THE INFRARED TELESCOPE FACILITY

While it is recognized that the National Science Foundation (NSF) is the lead agency for ground-based astronomical research, it is also recognized that there are some ground-based astronomical research activities required by the National Aeronautics and Space Administration (NASA) in support of its mission. Decisions by NASA to support such activities are made on a case-by-case basis and reflect the direct contribution of these activities to NASA's own program objectives. Careful coordination between NSF and NASA is maintained concerning the support of such work. The Infrared Telescope Facility (IRTF) was developed by NASA to obtain observations to support the NASA solar system exploration program. It plays a unique role in that program, both in providing direct scientific and operational support and in the demands for observing time which the NASA program places on it. Approximately one-half of the total available observing time on the IRTF continues to be used for NASA-required observations, with the remainder of the observing time being made available to the astronomical community to undertake observations of general scientific interest.

To acknowledge this situation and to optimize the benefit of the IRTF to both NASA and the astronomical community at large, it is hereby agreed by NASA and the NSF that:

—NASA will, subject to the funding provisions noted below, provide long-term operational support for the IRTF to provide the management control needed to assure that the agency's mission-oriented objectives will be attained and that high-quality astronomy research will be possible using the facility.

—NSF will endeavor to provide support for the development of instrumentation for the IRTF needed to maximize the value of the facility to the general astronomical community. Provision of such support will be dependent on the receipt and evaluation of appropriate proposals which are to be reviewed on the basis of their merit following standard NSF procedures.

—NASA will reexamine the role of the IRTF in its programs periodically, at intervals of approximately 5 years. Should it become apparent on the basis of this reexamination that the IRTF is no longer required to support its mission, NASA will initiate timely discussions with the NSF and/or other interested parties concerning future support of the facility.

—The activities of NASA and NSF, under this memorandum of agreement, are subject to the respective funding procedures of each agency.

—This memorandum of agreement is not a funding document for the purpose of incurring or recording NASA and NSF obligations. Such obligating documents shall be separately executed through regular agency procedures.

JAMES M. BEGGS,
Administrator, National Aeronautics and Space Administration.
EDWARD A. KNAPP,
Director, National Science Foundation.

HOUSE REPORT ON THE SPACE TELESCOPE

Senator GARN. As you know, last month the House Surveys and Investigations staff completed its report on the Space Telescope. The report concluded that research and development costs on the telescope have increased from $435 million to $797.2 million, a $362.7 million increase. The study team found, after discussions with officials of Perkin-Elmer, the optical telescope assembly contractor, that since the inception of the contract, NASA has made 141 contract changes, costing approximately $173 million. Since fiscal year 1978, the Perkin-Elmer contract grew from $69.4 million to $279.7 million, with current cost growth likely to push this amount to $319.7 million during fiscal year 1983. The study attributes a large proportion of this dramatic increase to technical changes, poor management, and schedule slips.

Of particular interest to me is the finding that:

> Headquarters NASA established an initial manning cap of 90 personnel for the Space Telescope program. This amounted to less than 50 percent of manning NASA would normally allocate to a program of this magnitude.

Two years ago, this subcommittee expressed concern over the fact that only three professionals were permanently on-site at Perkin-Elmer, and we were already aware that the contractor was experiencing problems holding to schedule and costs.

We understand, for example, that NASA has approximately 250 people involved in the space platform program. And this level of involvement is for a program that is around a $30 million range in fiscal year 1983.

Two years ago I asked NASA several questions about the implementation of the recommendations resulting from your management study—Hearth report. Last year, I again questioned you about your implementation of the recommendations contained in that study, specifically the action you have taken to strengthen NASA's in-house capability for contractor monitoring to assure early identification of technical and cost problems. When I first questioned the former Administrator, Dr. Frosch, about this issue, he stated that the agency had let its in-house capability slide downhill too much.

In response to this recognition, and the questions I posed last year, you stated that a NASA handbook and policy on project management had been issued. You further stated that both of these documents cover the necessity of adequate project identification and the role of the project manager in assuring that our contractors will be monitored in an organized fashion.

CONTRACT MONITORING

What management changes have you made at NASA to address the problem of contract monitoring?

Mr. BEGGS. What we have tried to do is reemphasize and reinvigorate the system management role. The handbook to which you referred is a "cookbook" of various things that need to be done in the initiation of projects and the subsequent management of projects.

We have stopped levying against the center an annual cut in manpower which is going to help quite a lot in a number of respects, not the least of which is the maintenance of a reasonably high morale level which definitely contributes to good management of the project. With all that, however, I have got to say, Mr. Chairman, that it is likely that in conducting a program of research and development as we do, that we will, from time to time, have surprises because what we are trying to do is at the cutting edge. It does mean that occasionally we are going to underestimate the requirement to do a job. We have in the past; we will in the future; and we certainly did on this one.

We are embarrassed by two things. First, we are embarrassed that we were not foresighted enough to be on top of the problems that we have run into. Second, we are embarrassed by the fact that we let this creep up on us and the overrun occurred in a time sequence that we couldn't properly budget for.

EARLY WARNING OF CONTRACTOR PROBLEMS

Senator GARN. Doesn't it just indicate that you have to have early warning. You can't rely on the contractor to say, "I am getting into trouble."

Mr. BEGGS. Sure. We did two things. When Dr. Mark and I came to the agency, we reviewed the various programs. This was clearly one that we were concerned about as it is certainly the second most important project in the agency, right after Shuttle. We realized it was going to require a lot of attention, so we had a review of the Space Telescope shortly after we came to the agency. We had another review late in the winter of last year, February, I believe. Then we had a review, I think, in October of last year because you could smell that something was wrong. Things didn't seem right. In my long experience with programs of this type, this is usually the way you get the first problem indication; a lot of different indicators rather than any specific report.

We have done, I think, as good a job as can be done of requiring the necessary paperwork. The reporting requirements are adequate. What has not been adequate is the degree of attention that the program management office at NASA has devoted to technically auditing what is transpiring at the contractors. We have made a couple of mistakes that have impacted both the schedule and the cost.

But, I think the paperwork system is adequate to uncover the problems, if the contractors are reporting truthfully. In this case, for whatever reason, they were not reporting the total story to us. We should have backed that paperwork system up with an in-depth technical audit which probably would have uncovered this problem last summer or early fall. I don't think we could have uncovered it any sooner than that. However, we would have been on top of it probably 6 months earlier than we were.

STAFFING NEEDS FOR NEW STARTS

Senator Garn. I don't want to take more time now but I will have additional specific questions that I would like you to respond to for the record.

Last year, I stated that we would like you to include a listing of your staffing needs each time a new program start is initiated. I do not see that information in your current budget submission for the Venus Radar Mapper or the Numerical Aerodynamic Simulation program.

Could you please provide that information for the record?

Mr. Beggs. We certainly can. The Venus Radar Mapper is under the supervision of the Jet Propulsion Lab; but we will certainly supply the information.

[The information follows:]

STAFFING PLAN FOR THE VENUS RADAR MAPPER

[Man-years]

	Fiscal year—						
	1984	1985	1986	1987	1988	1989	Total
NASA headquarters: Civil service	1.3	1.3	1.3	1.3	1.5	1.5	8.2
JPL: Non-civil service, R&D funded	60.1	83.1	99.5	90.5	60.5	34.2	427.9

All other manpower (approximately 900 manyears) will be provided by the two principal contractors.

Numerical Aerodynamic Simulation

The fiscal year 1984 requirements for civil service staffing are 26 professional and 15 support personnel. These requirements will be met within the current fiscal year 1984 Ames Research Center personnel complement ceiling.

Senator Garn. Have you determined what staffing levels are necessary for those two new starts?

Mr. BEGGS. I believe that we have a good estimate on both of them.

Senator GARN. And you believe you have assigned sufficient personnel to be able to monitor the contractor?

Mr. BEGGS. Yes, sir, I do. I think we are on top of both of those projects. There will be a complete review of the Venus Radar Mapper later this year as the center gets the plans laid out in greater detail. We will know very well where we stand after that review.

$35 MILLION DEFERRAL

Senator GARN. Due to the reformation of the Tracking and Data Relay Satellite System contract, it was possible to reduce the IUS procurement for the satellite system from six to four vehicles. Both the House and Senate committees have approved the deferral of the associated $35 million that would have otherwise been used for the IUS procurement. Your budget justification notes, however, that $17 million of the funding previously planned for IUS procurement has been deferred and reallocated to Shuttle operations.

Given your problems with the Space Telescope, would you propose to use the deferred funds for the Telescope and, if so, what impact, if any, would it have on the Shuttle program in fiscal year 1984?

Mr. BEGGS. The answer is that we are looking at using that money to cover the overrun on the Space Telescope in 1983. I don't believe that we have an impact on the Shuttle in 1984. However, we are looking at the Shuttle program in 1984 with respect to spares, particularly in the main engine area, and we will probably have to move some money into the Shuttle main engine program from some other program areas. But I think we can adequately cover that within the budget.

DELIVERY OF OV-103 AND OV-104

Senator GARN. Your budget justification indicates that you expect a delivery of the third orbiter in September 1983 and the fourth orbiter in December 1984.

Based on your most current data, are the September 1983 and December 1984 schedule dates still firm?

Mr. BEGGS. They are tracking well on the 1983 delivery of Discovery, I am a little more worried about the delivery in 1984. I think it is a little early to say that we can't make up some time in the coming unit because we have made up time in the previous units. But the 1983 delivery looks pretty good right now, lacking any unforeseen problems. I don't believe we will have any because we have been through it twice now.

Senator GARN. Using fiscal year 1982 dollars, would you provide for the record the cost for orbiters?

Mr. BEGGS. Yes, sir.

[The information follows:]

The cost of production orbiters in the fiscal year 1984 budget is as follows:

[In billions of dollars]

	Fiscal year—	
	1982	1984
OV-099 (Challenger)	1.168	1.169
OV-102 (Columbia): Upgrading to operational configuration	0.234	0.244
OV-103 (Discovery)	1.114	1.137
OV-104 (Atlantis)	1.191	1.277

Orbiter cost includes vehicle, main engines, Government-furnished equipment (such as closed-circuit televisions, remote manipulator arms, galleys, and tape recorders) and prorated contract administration expenses.

PRIVATE FINANCING FOR OV-105

Senator GARN. Last year I questioned you about the proposal for private financing of the fifth orbiter. What is the status of that proposal?

Mr. BEGGS. The proposal is still pending. The proposal is qualified in a number of ways, Mr. Chairman, which, since it is a proprietary proposal, I would prefer not to disclose on the public record. But the offer is still open. Some of the qualifications that are in the offer make it quite difficult to negotiate a deal with the organization. However, we have continued discussions and will continue discussions to see whether there could be a way of accepting private funding of a fifth orbiter. My view on it right now is that it is very difficult to figure out how you would divide the market, which is a major stumbling block in view of the current market projects that we have in the agency.

Senator GARN. I realize the difficulty of being very precise at this time. But if you could supply for the record what tentative conclusions about the requirements would have to be met in order to support the private financing of the fifth orbiter, I would appreciate it.

Mr. BEGGS. All right, sir.

[The information follows:]

PRIVATE FINANCING OF FIFTH ORBITER

Private financing of the fifth orbiter would involve a number of considerations. Among the conditions we would propose to include in any agreement are:

(*a*) Any agreement between the Government and a private-sector proposer to purchase an orbiter must provide, under fair reimbursement, for the Government to exercise, under extraordinary conditions, its priority for national security and rescue or NASA priority missions.

(*b*) The prime requirement of the national STS is to have a safe system, and the private-sector proposer would have to agree to an orbiter configuration which satisfies that requirement.

(*c*) An agreement between the Government and a private-sector proposer for the purchase of an orbiter cannot be exclusive, without competition, or must maintain an option for other interested parties to participate on a similar or equal basis.

(*d*) Any final agreement between the Government and a private-sector proposer for the purchase of an orbiter must be a public agreement, which is demonstrably in the Government's interest as well as meeting the legitimate needs of the prosper.

NAS REPORT ON SHUTTLE OPERATIONS

Senator GARN. On October 27, 1982, Chairman Boland and I requested that the National Academy of Sciences undertake a program review of Space Shuttle operations. Specifically we requested that the Academy estimate the number of annual Shuttle flights given a four- and five-orbiter fleet, under normal turnaround conditions. We also asked the Academy to determine the facilities and resources needed to support various flight rates.

Tuesday, the Academy transmitted its report on this study. I know that it is too early for NASA to have analyzed the conclusions contained in the report, however, I would like to get some general comments from you on a few of the issues raised by the Academy and then ask you to respond to the report for the record.

In analyzing the orbiter flight capacity, the Academy established two scenarios. One was designated as conservative and the second was called an optimistic scenario. As a result of their analysis, the Academy found that under the conservative scenario we could expect a flight rate of around 17 flights per year with a four-orbiter fleet. Under the optimistic scenario, we would expect a flight rate of 25 per year. They further go on to state that even in the conservative case, the loss of, or major damage to, a single orbiter in service or any number of other unfavorable conditions would preclude reaching estimated flight rates.

Now NASA has been telling us that their expected flight rate in the 1990 time frame is 24 per year.

Do you still maintain that 24 flights per year is a reasonable estimate for a four-orbiter fleet?

Mr. BEGGS. If I may comment in general, the study pretty much parallels the work NASA has done internally looking at the same problem. In fact, the Academy uses many of our assumptions in the development of its figures. We would have to say that we pretty much concur in the conclusions that they reached. I was just briefed on the report. There are a couple of the conclusions that I would like to go back to test their assumptions because they don't look right to me. But overall, I would have to concur in the conclusions that they reached.

We have generally based our 24-per-year flight rate on an ability to fly each orbiter up to eight times per year, which means with three orbiters you could sustain a 24-per-year flight rate for a short time, but not on a continuing basis. We do believe that with four orbiters available to us and using somewhere between their optimistic and their conservative range of estimates, that we can hold to around a 24 per-year flight rate. Should we lose an orbiter or damage one severely so that it would be out of service for a long period of time beyond the normal 5 months that we have built into that schedule—that is, 5-month layups every so often to bring an orbiter up to current configuration and do the general overhaul and maintenance work—if we lose one for a longer period of time, then we would clearly have to look at constructing a fifth one, or a spare one, whichever way you want to describe it. It was for that purpose that we initiated the program in 1984 to buy structural spares and to buy as much of the other subsystems as we thought we required for the long lead time requirements so that we would be in a position to assemble another orbiter if we lose one.

In summary, I think that the NAS report and our studies and planning are more or less consistent. They are a little more conservative than we are; but, in general, we would find little to argue in what they have concluded.

SHUTTLE FLIGHT RATE

In the long term, however, if one wants to build higher flight rates of 30 or 40, there are many elements in the program which would require augmentation or addition. The mobile launcher platforms, some of the assembly activity down at Kennedy, and a number of other areas of the program would have to be augmented.

We recognized that last year when we first focused on building up to that 24-per-year flight rate. The idea was that we ought to first aim at what was an achievable flight rate within the tooling, the amount of money that we had put into the facilities in general at Kennedy, Marshall, and Johnson, the test facilities and the other equipment and production equipment which was required to sustain that flight rate. So, this was why we set up the 24-per-year rate.

Right now I would have to say that we have not seen the kind of rapid development of the market that we had previously predicted. As a matter of fact, the market is following the lower end of the band that was projected early on. But if the market starts to develop—and many things could cause it to start developing rapidly, one would be a continued problem with the Ariane—then we would have to consider the augmentation of the orbiter fleet first and probably the augmentation of a number of other elements of the program, such as the solid rocket booster, external tanks and other expendables, production, the mobile launcher platforms, and probably some pieces and parts of our assembly facility down at Kennedy.

But so far we have not seen that demand. My expectation, however, and this is simply a top-of-the-head kind of assessment, is that after we start flying the Shuttle at higher rates the market will develop more rapidly than we have seen in the early years and we may, indeed, see a need for higher flight rates. I think we have adequately planned that we have the production capability to augment the fleet and to augment the other parts of the system when that becomes necessary.

The President himself has stated that, should the more optimistic forecast materialize, he would certainly support the augmentation of the system.

Senator GARN. The report further talks about some bottlenecks in the system. You touched on the vehicle assembly building, the mobile launcher platform, and the launch pad. Rather than taking more of your time now, I will submit some additional specific questions about the costs associated with an increased launch rate.

STOP-WORK ORDER ON DELTAS

On January 28, you requested a reprograming in order to compensate for a reduction in the expected reimbursable receipts from your Delta expendable launch vehicle. In my February 28 reply to that reprograming, I took exception to your decision to terminate the Delta program after the final firm commitment vehicles are delivered. I stated that:

> The decision to close this expendable option should only be made after the implications relative to both Shuttle launch capabilities and potential commercialization of the Delta vehicles are thoroughly explored.

I further stated that:

> I would, therefore, request that NASA not take any action to phase out the Delta program until further discussions are held with this subcommittee.

As your budget justification indicates, the Delta launch vehicle program is planned to be operational until at least 1986. This system is the most utilized of NASA's current expendable launch vehicles and is used on a requirements basis for launching missions for the U.S. Government and commercial and international customers. To date, there have been approximately 165 launches with over 92-percent success rate.

In January, NASA issued a stop-work order for Delta's 179 through 184. In response to that proposal, McDonnell-Douglas, the manufacturer, proposed to restructure the program to include the completion of numbers 179 through 181 and to add additional Deltas up to 184 at NASA's option.

What is the current status of the McDonnell-Douglas counterproposal?

Mr. BEGGS. Since we now have the payload for vehicle 179, we are reinstating that one. And we probably will look favorably on extending and buying vehicles 180 and 181 because that proposition is a very attractive one, financially, to us. We are also looking very hard at what they have proposed to retain the option to assemble the other vehicles; that is, up through vehicle 184. We believe that we have adequate time within the current schedules to examine in great detail the options for private ownership and operation of the Delta as well as the Atlas Centaur and even the Titan. There is a proposal going forward which will lay down ground rules for the use of the other Government activities that a private contractor would need to take over those systems and I think there is a reasonable chance that somebody will step up to that. If they do and if they are willing to provide that backup on a long-term basis, it will solve the problem we have which is that of an uncertain market in the outyears. If we can transfer that risk to the private sector and if they are willing to accept it, it would help us considerably.

ROLE FOR ELV'S IN FUTURE

Senator GARN. On March 24 I asked the Office of Science and Technology Policy what role they saw for expendable launch vehicles in our future space program. Their answer was:

> Maintaining expendable launch vehicles in the U.S. space program is totally consist-

ent with the current national space policy. The policy specifies as a basic goal the expansion of private-sector investment and involvement in space and space-related activities.

They further stated that:

Maintaining the expendable launch capability does not conflict with using the Shuttle as the Government's primary launch vehicle. In fact, commercial expendables would serve as a backup capability to critical Government missions and permit the United States to take maximum advantage of the unique capabilities offered by the Space Shuttle.

Do you agree with this assessment?

Mr. BEGGS. Generally, but not completely. I would like to have Dr. Mark comment on that with your permission.

Senator GARN. Dr. Mark.

Dr. MARK. Two points, Mr. Chairman.

One is, of course, as Mr. Beggs has said, we are looking toward encouraging the commercialization of existing launch vehicles and there are problems connected with the question of using Government facilities that have already been alluded to. I think there is another point that is generally missed. That is, when we actually talk about expendable launch vehicles, we are always talking about Deltas, Atlas, Titans, or Centaurs—things that already exist.

The truth is we will have mixed-mission launchers in the future. The Shuttle will not be the only launch vehicle we use. But in developing the technology of the Shuttle, we have advanced all launch vehicles enormously. We have built better rockets. What we ought to look for is an expendable and not call it expendable, but an unmanned launch vehicle capability that is based on the technology of the Shuttle. If you take the solid rocket boosters, they form the basis for a very good space launch vehicle.

You can probably, in the end, orbit payloads more cheaply than the Atlas because you can recover the SRB and fly it again just the way we do with the Shuttle. If you develop three sets of these SRB's together, then you have a humdinger of a launch vehicle and you can do that in such a way that you can use the same launch pads that we use for the Shuttle. We can do the geosynchronous with three SRB's. You fire two of them off and leave the middle SRB alone; then, light it off at 10,000 feet and you are on your way.

Mr. BEGGS. I think what we really should look toward is a two-step process. One is fine, if people think we can use the old launch vehicle to do so, but I don't think we ought to strap ourselves into old technology. Our old launch vehicles are now 20 years old or more. What we really should look toward, Mr. Chairman, is the creation of a new generation, not of expendables, but of unmanned or recoverable launch vehicles to take care of the traffic needs that we foresee in the future.

PAYLOAD CAPABILITY FOR SHUTTLE

Senator GARN. The development of a filament-wound case for the solid rocket boosters has been initiated by NASA in order to improve the payload capability of the Space Shuttle for high-performance missions. Your justification indicates that the expected weight reduction as a result of using a filament-wound case, in lieu of the steel cases, is estimated at 66,000 pounds. I understand that such a weight reduction could result in a payload capability improvement of approximately 5,500 pounds.

Based on your latest engineering data, does it appear that you will be able to achieve this 66,000-pound weight reduction?

Mr. BEGGS. I would like to have Dr. Mark, who is more familiar with that, respond.

Dr. MARK. Mr. Chairman, in addition to the situation that we have with the Shuttle main engine program, we initiated about a month ago a thorough review of where we stand with the filament-wound case in order to anticipate just the kind of concerns that you have. We have had some problems in the test program and particularly in the question of scaling the test; that is, what size units do you need to test in order to assure yourself that the full-size, filament-wound case will, in fact, take the pressures that are developed when this thing burns.

I just got a report this morning. It looks very much as if the payload capacity can be met. We do have a problem in dealing with the fact that the filament-wound cases are not as stiff as the steel cases; and, therefore, the dynamics of the launch will be rather different. This is something that we are just beginning to understand.

In terms of your specific question on the weight, I believe we will be able to meet the weight requirements.

Senator GARN. 66,000 pounds?

Dr. MARK. Yes, sir. I do believe we will need to develop a testing program that we do not yet have in order to be able to assure ourselves that we can reuse the filament-wound cases.

In other words, my answer is that for one flight we can do the payload; there is no problem. We are concerned whether our testing program will assure us that the heating the filament-wound case gets in undergoing flight and recovery will allow us to fly it again. This is still an open question.

1984 FUNDING FOR FILAMENT-WOUND CASE

Senator GARN. What level of funding have you requested in 1984 for the filament-wound case program?

Mr. BEGGS. About $80 million, Mr. Chairman.

Senator GARN. And so at this point, Dr. Mark, you have a current estimate of the number of reuses you might be expecting?

Dr. MARK. No, sir.

Senator GARN. What is your estimate of the production cost of the filament-wound case versus the steel case?

Mr. BEGGS. I don't think there is a great deal of difference in the cost of one or the other, although I am a little more optimistic than some of the folks in the agency that after you set up to wind the filament, the price is going to come down because you have a non-labor-intensive proposition there as opposed to a labor-intensive proposition with the steel case, so I think we will achieve some savings in the long run.

Senator GARN. The real determinant if it costs the same or less is that you will reuse——

Mr. BEGGS. That is correct. We are going to have to work that very carefully over the next couple of years. We must study very carefully the failure mechanisms and the way in which these cases act in order to assure ourselves that we can get reuse. It is our expectation that we will eventually end up reusing them, but we simply don't understand yet what is going to happen to them. Therefore, we are not in a position to say that they will be reusable or how many times they will be reusable.

Senator GARN. Senator Huddleston.

Senator HUDDLESTON. Thank you very much, Mr. Chairman.

First I apologize to you and to our witnesses for being late this morning. This is a subject I have a lot of interest in and I have enjoyed the work that we have been doing over the years in this field.

Senator GARN. If you will endorse what I said in my opening remarks about future space flights, I will excuse you for being late.

Senator HUDDLESTON. The last time you volunteered to go on a flight; is that in the statement?

Senator GARN. That is what I am talking about, endorsement from the ranking minority member.

Senator HUDDLESTON. I endorse that. [Laughter.]

TECHNOLOGICAL PREEMINENCE

If you will bear with me, I will make some observations too.

I understand that both the House and the Senate authorizing committees are adding funds to NASA's request. I think this is particularly important in the space applications field. I am not a scientist or an engineer, but I know that our Nation has enjoyed a technological preeminence which has enhanced our capabilities, expanded our foreign trade opportunities, and given us stature as a nation we could not otherwise have achieved.

I fear, however, that that preeminence is threatened—threatened by short-term and short-sighted budget decisions that may grind generic research to a halt, stem the dissemination of scientific and technical information, and limit the application of our most sophisticated developments to real world problems.

There is research that private industry simply cannot do. And, even where it can, there is often a Federal benefit in supporting and encouraging research efforts which can then be applied by our industries to develop better products and to compete more effectively abroad. We live in an increasingly technological world, and we cannot afford to be left behind.

Fortunately, our subcommittee chairman has been extremely sensitive to research needs, particularly in the aeronautics and communications fields. I hope we will continue to work on these areas.

I would also like to comment briefly on remote sensing activities, although I know that NASA's role is increasingly limited there. Personally, I have seen little that argues for commercialization of Landsat and METSAT. I have grave concerns about continued availability of data at reasonable costs under such an arrangement, and I have grave reservations about continued R&D efforts in the outyears.

On March 15, I introduced legislation which was incorporated into the jobs bill as a sense of the Congress resolution to the effect that there should be no sale without congressional approval. I understand a similar provision may be included in the Senate version of the NASA authorization bill. Serious issues regarding cost, availability of data, reliability, and research and development must be addressed. Otherwise, individual citizens, agricultural interests, the business sector, and national security may suffer from that kind of action.

LANDSAT THEMATIC MAPPER

First, then, a question on Landsat. On February 15, I understand the Thematic Mapper X-band transmitter failed, impairing transmission of data to the ground stations. What is the current situation in regard to those transmissions?

Mr. BEGGS. That anomaly still persists, Senator Huddleston. We have tried very hard to understand it on the ground. We have tried a number of fixes, so far unsuccessfully, but we are still trying. My guess is that we are going to have the Tracking and Data Relay Satellite System up there and operational before we find an answer to the X-band problem. So, in short, we will get the Thematic Mapper back as soon as we get the TDRSS operational because that is built into the Landsat system.

Senator HUDDLESTON. What real options do you have?

Mr. BEGGS. The best one is, to get the TDRSS operational and use it, because not only is it a satisfactory substitute, it is a better substitute. It gives us almost complete Earth coverage for receipt of the data, that is once we get two satellites operational. But even with the one, we will be able to regain control. TDRSS, of course, uses a different transmitter than the X-band transmitter and we know it is operating satisfactorily.

The second option is to continue to explore possible ways to fix the X-band transmitter. We are running out of possibilities there. There may be a catastrophic failure in that X-band transmitter that will make it impossible; we are going to reexamine the transmitter in subsequent satellites that use the same X-band system so that we can redesign it to obviate the kind of failure we got in the Landsat.

I am optimistic that that satellite will live through its currently planned life and we will get the data we need.

Senator Huddleston. With your current capability, is a retrieve mission possible?

Mr. BEGGS. Not with our current capability. A long-range retrievable mission possibly would be an option. The satellite is built for retrievability and in the long run it would be possible.

FISCAL YEAR 1984 LANDSAT FUNDING

Senator HUDDLESTON. You have requested $15.8 million for Landsat in fiscal year 1984. Is most of this funding connected with research on the Thematic Mapper?

Mr. BEGGS. Yes, sir, it is. There is some advanced research, I believe, as well, but that is a small amount relative to Thematic Mapper efforts.

Senator HUDDLESTON. Does this current situation affect the requested amount?

Mr. BEGGS. No, sir, we have already acquired a very large amount of data. As you know, Senator Huddleston, we are very hopeful that the first of the TDRSS satellites will be put into a satisfactory orbit in the near future, like in May. We will again start acquiring data near the end of this year. We will be in a position to do the data processing work and other research work to improve those images starting right now; but, the work will be enhanced toward the beginning of fiscal year 1984.

Senator HUDDLESTON. Is that in the budget request that you made, that kind of work?

Mr. BEGGS. Yes, sir. With respect to the decision that was reached to see if the system can be commercialized, it was understood that NASA would continue the R&D work and, indeed, there was provision made to insure that the Thematic Mapper data would continue to grow at NASA.

Senator HUDDLESTON. Even under the commercialized plan?

Mr. BEGGS. Yes, sir.

LANDSAT FUNDING BEYOND FISCAL YEAR 1984

Senator HUDDLESTON. Do you expect to make any funding request for Landsat beyond 1984?

Mr. BEGGS. The system was transferred officially under congressional direction to the Department of Commerce early this year. Commerce owns the system with the exception of the Thematic Mapper equipment and data which we will retain because that is experimental equipment.

Senator Huddleston. And R&D?

Mr. BEGGS. Yes, sir, but they own the system as well as the Landsat–D prime satellite which is in storage. It is out of our hands, in effect, as to any disposition that would be made of those assets; they no longer belong to us.

Senator HUDDLESTON. But you are still charged with the R&D?

Mr. BEGGS. Yes, sir. As I said, both the advanced sensors and the R&D. The advanced sensors are still a province of NASA and that was recognized in the decision paper that went forward on commercialization.

Senator HUDDLESTON. You mentioned the project is still scheduled for launch in 1985?

Mr. BEGGS. Yes, sir, but that is subject to change, of course, as we get more information out of the current satellite.

Senator HUDDLESTON. Landsat–4?

Mr. BEGGS. Yes, sir.

CONTINUED TECHNOLOGY DEVELOPMENT

Senator HUDDLESTON. And there is continued technology development?

Mr. BEGGS. Yes, sir, there is.

Senator HUDDLESTON. In preparation for the fifth?

Mr. BEGGS. In NASA's role in advanced R&D, we will be flying imaging radar again on the Shuttle next year. This is a very interesting R&D development for future Earth-imaging systems. We are developing some new systems in the optical range going from infrared to the ultraviolet. That program is quite active and the research is turning out to be quite fruitful.

Senator HUDDLESTON. Are you confident our research and development is keeping up and, hopefully, exceeding that of other countries?

Mr. BEGGS. I am confident we are still ahead of the rest of the world in this area. The Europeans have an intense interest in it; the French are planning a remote sensing satellite of their own, which they have commercialized in their own way; and the Japanese are very interested in remote sensing and are talking about launching a system. But I believe our technology is very significantly better than theirs and we will continue to maintain that lead as long as we continue the R&D program.

Senator HUDDLESTON. I have some other questions on that same subject that I would like to submit to you if it is agreeable?

Mr. BEGGS. Yes, sir.

AGRISTARS RESEARCH

Senator HUDDLESTON. Lets get into AgRISTARS a little bit and keep the chairman's time schedule as close as we can.

Senator GARN. Take whatever time you need to finish.

Senator HUDDLESTON. NASA in 1982 spent $14 million on AgRISTARS, in 1983 some $15 million. NASA proposes to terminate AgRISTARS but noted that AgRISTARS-type research and development will be continued by other agencies. What did you mean by AgRISTARS-type research?

Mr. BEGGS. The problem that we encountered on AgRISTARS is that we could not get a very positive statement from the Department of Agriculture as to the R&D in its future. They are continuing to spend money on the research and development, looking at the data to see whether that processing will be valuable to them.

Now we can do a lot with Earth-sensing equipment in forecasting crop yields and looking at the world from that point of view. To date, the Department of Agri-culture has not recognized the superiority of that information compared to the crop forecasting methods they currently use.

Senator Huddleston. What other agencies will be involved?

Mr. BEGGS. NOAA.

Senator HUDDLESTON. NOAA and Agriculture?

Mr. BEGGS. I think NOAA has $2 million budgeted in fiscal year 1984 and Agriculture has about $14 million budgeted in fiscal year 1984.

Senator HUDDLESTON. Did you make a request to OMB for the AgRISTARS program?

Mr. BEGGS. We requested $4 million.

Senator HUDDLESTON. If that were authorized and appropriated, how would you utilize it?

Mr. BEGGS. We would continue to support the effort that Agriculture is conducting; that is, to try to better understand the spectral properties and the way in which various crops appear in our data. It is interesting research and it does yield a greater insight into crop prediction yields in a very discriminating way. It distinguishes between rice, wheat, and various types of crops; this is a difficult job.

Senator HUDDLESTON. Like marihuana.

Mr. BEGGS. It is an R&D job and it is interesting.

Senator HUDDLESTON. It does pretty good on marihuana?

Mr. BEGGS. It does a very good job on marihuana. It tells you where the poppies are growing as well. Again, there are sources of information which are available to folks that they feel are almost as good for getting that information.

Senator HUDDLESTON. I understand.

TECHNOLOGY UTILIZATION

Moving over into another subject, technology transfer and utilization, the request for the Technology Utilization program is only $4 million in 1984 versus $9 million in 1983. The proposed decrease presumes a somewhat lower level than in fiscal year 1983 for dissemination of technical information.

What do you mean by "somewhat lower level"? Is there an idea of the degree we are talking about?

Mr. BEGGS. That cut would be fairly deep, Senator Huddleston. It has been the position that this information, if it is valuable to the companies and the individuals who receive it, that we ought to have it pay for itself by user charges, and that is basically the proposition we are considering. We would start to charge more heavily for it as well as curtail to a fairly substantial extent the free mailings that we now make of bulletins and manuals.

Senator HUDDLESTON. So it is a combination both of actually reducing the amount of information you are getting out plus charging for some that you do get out?

Mr. BEGGS. Yes, sir.

Senator HUDDLESTON. How will this request impact the university-based dissemination network? Will you be reducing the number of universities participating?

Mr. BEGGS. We are not proposing any reductions in the number of universities that are participating. They would still be involved in the program.

Senator HUDDLESTON. But the nature——

Mr. BEGGS. It would be a fairly hefty cut in the amount of material that is flowing out.

ADVANCED COMMUNICATIONS TECHNOLOGY SATELLITES

Senator HUDDLESTON. NASA is proposing a Government-industry cooperative agreement for the advanced communications technology satellites program. What is the spending profile on this program?

Mr. BEGGS. We proposed $5 million in 1984 for that. The objective of the program is to try to get from the beginning a joint industry-Government program. That will have a positive effect of reducing the Government expenditures. As you know, we have been developing the communications equipment for quite some time and our proposal is really aimed at trying to see this new technology applied as early as possible. So we would like to bring a company into partnership that has satellite manufacturing and operating experience. The objective is to piggyback onto one of their ongoing efforts and, consequently, to get the equipment tested, perhaps to the point of application at an earlier time frame. We have initiated a request for proposal activity and the responses are due in July. We do have some expressions of interest on the idea.

Senator HUDDLESTON. Do you have any idea what the outyear cost situation might be?

Mr. BEGGS. It depends on what kind of response we get to that proposal. We originally budgeted up to $350 million for this activity.

Senator HUDDLESTON. Has an agreement been signed or do you expect to sign one soon?

Mr. BEGGS. No, there has been no agreement signed. We expect responses in July. Assuming we get a reasonable proposal to what we have asked for, we will probably start this program some time this fall.

Senator HUDDLESTON. At this point you have not identified the party that will be involved in that?

Mr. BEGGS. No, sir, we have not.

Senator HUDDLESTON. You are requesting $5 million for 1984 for this program; how much do you expect the private groups to contribute?

Mr. BEGGS. Our original plan was based on the fact they might have a commercial bus satellite in the development phase so that we could piggyback on. They would, therefore, contribute part of the money necessary to put our equipment in the satellite and we would put up the aforementioned $5 million or so, plus the $20 million that we had carried over from 1983. So we would have $25 million to put into the program initially. I would expect that their satellite would be carried on the Shuttle.

In the outyears, we would need money to continue to follow the program and to continue to analyze the results of that flight program.

Senator HUDDLESTON. What was your request to OMB for the non-ACTS communication activity—what is your highest priority?

Mr. BEGGS. $16.4 million was our request to OMB, which doesn't count the activity on search and rescue which is also a communications program.

Senator HUDDLESTON. What is your top priority?

Mr. BEGGS. The research and analysis area is the main one. We are looking forward to a joint Canadian mobile communications program.

There is a Canadian proposal currently under consideration for a mobile communications satellite system and we are interested in supporting that research. I think those are the primary activities.

LAUNCH UMBILICAL TOWER AT KSC

Senator HUDDLESTON. You have already touched on the launch tower and the preservation option. I believe you mentioned $1.8 million as the cost of the preservation option?

Mr. BEGGS. Yes, sir.

Senator HUDDLESTON. What is the basis of that estimate?

Mr. BEGGS. We actually went out and requested bids with an option from the successful bidder to remove the tower. Subsequent to that, we had a number of contractors come in to take a look and see if there were a better way, a more effective way, of getting that tower off. We didn't find anyone.

As a matter of fact, they all pretty much concluded that what the successful contractor had proposed was about the best way of doing it. That really required some disassembly because we can't get that tower under a crane. So we will have to disassemble it into probably three pieces, lift it off in pieces, and then restack it. And we have initiated with the contractor a plan to do that. The problem subsequent to that, as I mentioned in my statement, will be what you do with it then. It is a fairly high tower when it is assembled and it will require a substantial foundation to withstand the occasional high winds that you get in that area as well as probably girding and other supports to make sure it is safe wherever we put it. We estimate that cost to reassemble and erect it in the order of $8 to $10 million.

Senator HUDDLESTON. Has any party or group expressed an interest in assuming that project for you?

Mr. BEGGS. Not yet.

Senator HUDDLESTON. Mr. Chairman, I have a number of questions on the ELV's, the Space Platform, defense applications, and the Space Telescope. I would suggest we just submit to them for the record after making sure that they are not duplicative of what you may have already inquired about in the course of the hearing.

Finally, I would like to express my thanks for the help that the agency has given me in getting an exhibit set up at our Mountain Laurel Festival in Kentucky. It is a big event, with a long tradition, and we appreciate the prompt cooperation we received.

I guess I might, like you, Mr. Chairman, have one complaint that I ought to make just to keep you fellows on your toes a bit. I have some questions I am going to submit on behalf of Senator Stennis. We had some difficulty earlier in getting the information on the Mississippi facility that he is inquiring about. The information did not come in for more than 3 weeks and it was somewhat sketchy at the time. I hope that we can get prompt answers to these questions being submitted on behalf of Senator Stennis.

Mr. BEGGS. Yes, sir. Part of the problem with that earlier request, Senator Huddleston, was the fact that we were in the process of replanning our activity down at NSTL and we really didn't know what our test schedule was going to be. I think we are in a position now to tell you fairly clearly where we stand on the NSTL activity. From Senator Stennis' point of view, I think he will be reasonably well satisfied with what we plan for NSTL.

Senator HUDDLESTON. We will be sure to pass that on to him.

FLIGHT-READY SPARES

Senator GARN. Thank you, Senator Huddleston.

I have two or three more questions and then 92 pages of questions for the record.

Your Shuttle engine program calls for the procurement of 39 main engines. Twelve of these will be installed in the four orbiters, another seven will be spare engines, and the remaining ten will be test items. Recently, on STS-6, you experienced considerable difficulty with the main engines and, in fact, had to replace all three of them.

Given your current fiscal year 1983 and fiscal year 1984 engine procurement, how many space flight ready-spares will you have at the end of fiscal year 1984?

Mr. BEGGS. At the end of 1984 we should have three, I think. That is one area we would like to augment, Mr. Chairman. We are looking right now at the possibility of buying four more as spares because I think we planned pretty close to the margin in engines. This is the one component of the system where we have pushed on the state of the art. This is a very, very high performance machine and we think that prudence would dictate that we buy four more. These cost currently about $35 million apiece and when you think that we might have an orbiter laid up for a number of months because of insufficient engines to fly, that is a good investment.

But the directive given to General Abrhamson is to have engines and spares for the orbiters as the first priority. This is not to say it is not important to continue testing. We are going to continue the test program, but the first priority is to have sufficient engines backed up for the flight programs because we do have customers now. We do have a schedule laid out. We think we can get back on schedule by the fall of this year. But we want to insure that we don't put any further schedule slips into the program.

Senator GARN. If the Congress provided advanced funding for engine procurement in June of fiscal year 1983, would this significantly accelerate the availability of additional engines?

Mr. BEGGS. It would be helpful, without any question. It might save us some time. The lead time on an engine is 48 months. So an advance on the current schedule is always helpful.

TDRSS FINANCING

Senator GARN. In fiscal year 1983, you requested $61.3 million for the Tracking and Date Relay Satellite System (TDRSS) to the Federal Financing Bank. In your fiscal year 1983 operating plan, you reduced this amount by $10 million to $51.3 million. This reduction was due to a change in the date for the initiation of loan repayments and a revised estimate on the total amount to be borrowed.

What is your current best estimate for the requirements in fiscal year 1983 as a result of the final negotiation of the contract and the expected delay in the operational date for the TDRSS?

Mr. BEGGS. The amount that was to be repaid to the Federal Financing Bank in that $51 million was about $30 million. I think we may have not put this forward as clearly as we should have, but the rest of that $51 million was to be spent in the operations side for the program. I think any more detail than that we ought to refer to Mr. Smylie.

Mr. SMYLIE. Originally, most of the $51 million would have gone into the repayment of the loan to the Bank. As the year unfolded and our drawdowns from the Bank were taken and as the interest rates came down, the requirement for the Bank payment came down somewhat. At the same time, some of the requirement rolled over into the operations payment on the contract for fiscal year 1984. So part of it goes there instead of to the Bank because of the way the loan payment schedule is arranged.

So the net amount of money that goes to the contract and the Bank remains at about roughly $40 million and the other $10 million goes to the operation of the noncontract part of the TDRSS operation.

Senator GARN. Is there any cost savings that could be used for the Space Telescope?

Mr. SMYLIE. The $51 million is required to fund the payment to the Bank, the operations payment to the contract, and the operations payment to operate NASA systems, such as the Network Control Center. I don't think there are any dollar savings there. Of that $51 million, $20 million will be utilized in fiscal year 1984 rather than fiscal year 1983, but that was taken into account when the fiscal year 1984 budget was put forward.

Senator GARN. How does this affect the 1984 request for $242.9 million?

Mr. SMYLIE. It does not affect it because that was taken into account at the time we established the $242.9 million estimate.

AERONAUTICS SYSTEM TECHNOLOGY FUNDING

Senator GARN. As a result of congressional action in fiscal year 1983, you programed money for the following activities in your aeronautics system technology program: Energy efficient transport, laminer flow control, advanced transport operating systems, composite primary aircraft structures, energy-efficient engine, advanced turboprop systems, general aviation/commuter engine technology, and broad property fuels.

In all, this represents an investment of $45 million in fiscal year 1983. I see that in your fiscal year 1984 budget, you do not have any funds included for these programs.

What was your initial request to OMB for these program areas?

Please provide for the record a list of the additional work that needs to be done in each of these areas.

Mr. BEGGS. About $20 million.

Senator GARN. Was it OMB's decision to chop them all out?

Mr. BEGGS. I guess I would like to defend the OMB which is a role I seldom play. What we actually did in the aeronautics budget is really as much NASA as it was OMB. We came to an agreement on the total amount of money, $300 million, in the program and then we worked to divide that money between the R&T base and systems technology programs. Dr. Kerrebrock can discuss in fuller detail some of the work in systems technology that was folded into the R&T base. So it really was as much our decision as it was the OMB's.

Our paramount priority in aeronautics this year was the Numerical Aerodynamic Simulation activity and OMB did agree we could initiate that in the fiscal year 1984 budget. In doing that, we had to move some other things around in the priority list because we considered that our No. 1 priority and other priorities slipped down. That is really the main reason the budget was constructed the way it was.

Senator GARN. Would you provide for the record a list of the additional work that needs to be done in each of those areas?

Mr. BEGGS. Yes, sir.

[The information follows:]

ADDITIONAL WORK NEEDED

The fiscal year 1984 aeronautics systems technology budget request to OMB included funding for three of the above-listed programs, for which no funding was included in the President's fiscal year 1984 budget to the Congress. The energy-efficient transport, energy-efficient engine, and composite primary aircraft structures programs work was completed as planned in fiscal year 1983. General aviation/computer engine technology and broad property fuels were 1-year fiscal year 1983 augmentations.

FISCAL YEAR 1984 REQUEST

[In millions of dollars]

	To OMB	To Congress
Laminar flow control	3.3	
Advanced transport operating systems (previously terminal configured vehicle)	8.7	
Advanced turboprop systems	8.7	

The laminar flow control program emphasizes the research required to understand the integration of laminar flow aerodynamics with wing-surface materials and structure, and with a variety of environmental effects. Work to be completed includes flight test and operational evaluation of leading edge systems, design of integral and glove surface panel structural concepts, aerodynamic design studies of laminar flow concepts integration, and establishment of a flight data base for natural laminar flow, hybrid laminar flow control, and laminar flow control transition analyses/designs.

The advanced transport operating systems (ATOPS) program supports research in aircraft systems that interface with other elements of the national airspace system. The emphasis is on the interface between the airplane systems and the external elements of the air traffic control and navigation systems and involves theoretical studies, simulation, flight test, and experiments. The program is conducted in close cooperation with the Federal Aviation Administration, which has the responsibility for the updated national airspace system. Additional work remaining to be done in 1983 includes completion of a conceptual study of automatic enroute air traffic control data link and display requirements, completion of installation and flight checkout of the upgraded B-737 computer system, flight testing of the energy controls system concept, and preparation of conclusions and recommendations from the preliminary integrated flow management study.

Proposed activities in the advanced turboprop systems program through 1984 include supporting research and technology activities in installation aerodynamics and cabin acoustics, large blade fabrication and test to prepare a propeller test assembly (drive system) for large-scale propellers, and supporting analyses and tradeoff studies, preparatory to flight research.

SPACE STATION

Senator **Garn**. As you know, OTA is currently undertaking a study of the need for a U.S. space station. In August, I wrote to OTA and asked them to specficially address several issues relating to the development of an automated station. Since they have not yet completed their study, I would like to ask you the same questions.

RELATIVE MERITS OF MANNED AND UNMANNED SPACE STATIONS

What are the relative merits of manned and unmanned space platforms? I won't have you take the time now. You can also supply it for the record.

[The information follows:]

Relative advantages attending unmanned and manned platforms are dependent on the mission requirements as well as tradeoff performance and cost assessments based on requirements.

Unmanned platforms will tend to be favored for single-purpose missions with well-defined tasks where possible failure paths can be anticipated (such as with the Space Telescope); for hazardous operations such as refueling or in environments which would preclude man's presence for an extended period as in the radiation belts; or when repetitious, fairly simple tasks only are required.

Manned platforms would be advantageous when the mission set is varied, if unanticipated situations or failures might occur, if real time decisions are required, such as response to observation, if supervision of various automated machines is necessary, or in general, when cognitive of manipulative functions beyond machine capabilities are required.

As machine capability increases, more of the tasks currently performed by man will be done better and less expensively by automation. We would intend to automate any space station in an evolutionary fashion as fully as practical, leaving to man those functions which cannot be done by or cannot be entrusted to machines. Several activities are underway which will help us to better define the most cost-effective man/machine roles for the 1990's.

FUTURE ROLE OF AUTOMATION/ROBOTICS

Senator **Garn**. What role can automation/robotics be expected to play in the construction and eventual use of the platform?

[The information follows:]

The basic question surrounding robotics is the allocation of duties and responsibilities: There are advantages to both man-operated and automated systems. A man gives you flexibility that may never be achieved with a machine and a machine gives you accuracy and precision far beyond the human capability. Thus, NASA'S current planning includes research into many automated functions for potential space station applications, so that many subsystems could be nearly autonomous. Robotics, an automation discipline, incorporates many automated functions to interpret and extend man's cognitive and physical instructions. Advanced robotics, that which would incorporate artificial intelligence capabilities, is still in early development stages. However, robotics could ultimately play a significant role in future space operations and, therefore, the technology involved in robotics development is important.

In general, the most promising application of robotics technology on a space station could ultimately be to accomplish tasks external to the station, such as docking assist, construction, vehicle fueling, satellite retrieval, and repair and upgrade functions. Robotics inside the station could perform repetitious operations such as those envisioned for material processing or life sciences operations.

COST OF MANNED VERSUS UNMANNED ENVIRONMENT

Senator GARN. What are the cost savings associated with not providing a manned environment?

[The information follows:]

Very preliminary estimates for providing a manned environment or habitability element (module) in a space station system are on the order of $2 billion (1984). However, it is not clear that elimination of this element would amount to any net savings. In some cases, missions are enabled by human presence. It would not appear possible to replace the capabilities provided by man for the cost of establishing this capability. Total elimination of human presence would severely impact total system potential in areas such as materials processing and satellite servicing in addition to the need for increased complexity in science missions.

Senator GARN. Does it make sense to consider a fully automated space module as the first step toward a manned space station?

[The information follows:]

We do intend, to the greatest extent possible, to fully utilize automation capabilities in the initial space station system. However, it does not appear that the state of the art in automation and robotics will be sufficiently advanced in the time frame under study to completely eliminate human presence. Rather, human presence will be employed to oversee automated functions and to identify those manual functions which are susceptible to future automation in an evolutionary fashion.

POSSIBLE NATIONAL BENEFITS IN ROBOTICS

Senator GARN. What national benefits or spinoffs might accrue if we are able to advance the state of the art in robotics, pattern recognition, and the like?

[The information follows:]

Current NASA funding for robotics technology, primarily in the Office of Aeronautics and Space Technology, is directed at vision systems, slave manipulators, supervisory control systems, and advanced and end effectors, sensors, displays, and controls. Inasmuch as space applications drive toward a higher level of artificial intelligence than most terrestrial industrial applications and would,, therefore, push the state of the art in automation, it is expected that benefits in many areas, including manufacturing and biomedical applications, could ultimately accrue.

Senator GARN. To what extent would designing a station around an automated concept help you define the truly necessary and repetitive functions to be performed by a space station?

[The information follows:]

Current planning activities are directed at automating the initial space station to the greatest extent possible. However, man's intellectual skills and sensorimotor capabilities are unequaled by current automated systems. It is, therefore, apparent that the complementary use of man and automated systems can attain performance greater than that of either fully manual or fully automated systems. It is likely that any future space station system will consist of both manned and unmanned elements combined in such a way as to attain the greatest performance and benefits.

Senator GARN. The last question I would have would simply be, do you believe it is possible by the hearings next year to give me a flight date now that I have the endorsement of the ranking minority member? I will let you know I will be asking that question next year while I continue to stay in shape.

Mr. BEGGS. We are getting a lot closer, Mr. Chairman. As we fly more, we are going to have more and more opportunities.

SHUTTLE PASSENGERS

Senator GARN. If you think I am kidding, each year you will find much tougher analysis of the entire budget request.

Mr. BEGGS. As you know, we are now going to fly some five-man crews and, indeed, in September of this year we will fly a six-man crew for the first time. We expect to be flying in the order of five or six in each of the flights that we fly, so there is going to be some room for passengers.

Senator GARN. I will offer to go as an experiment. [Laughter.]

Whatever, I would remind you that due to my background and little over 10,000 hours of flying, I won't be a totally useless passenger. I won't expect, by any means, to be a fully trained crew member, but I at least know enough to know what not to touch in the way of things, keep my hands away.

Senator Huddleston, do you have any additional questions you wish to ask?

Senator HUDDLESTON. No, thank you.

SUBMITTED QUESTIONS

Senator GARN. Gentlemen, we thank you very much for your appearance here today and apologize for the long list of questions for your response but we will get them to you and hope you will get them back to us as quickly as possible.

Thank you.

Mr. BEGGS. Thank you, Mr. Chairman.

[The following questions were not asked at the hearing but were submitted for response for the record:]

Questions Submitted by Senator Garn

Construction of Facilities

Question: In FY 1984 you are requesting $150,500,000 for your Construction of Facilities (CofF) program. This represents an increase of $53 million above the FY 1983 appropriated level.

Please provide for the record a listing of the specific projects included in your FY 1984 budget request, including the original request to OMB for each of these projects and the amount included in the budget.

Please prepare a list showing each of the items not included in the FY 1984 request that were, however, included in your original submission to OMB, include the amounts you requested for each of these items.

Please provide a list of those CofF projects that are related to Shuttle operations, include the original request to OMB and the amount contained in your FY 1984 budget.

Please indicate those items in the above list that are related to maintaining or increasing the flight rate of the Shuttle.

Answer: A listing of the specific projects included in the NASA FY 1984 budget request including the original request to Office of Management (OMB) and amount included in the budget follows:

Loc.	Project Title	Original Request ($000)	Final Budget ($000)
JSC	Modifications for Additional Chillers for Mission Control Center	1,300	2,300
KSC	Modifications to Mobile Launch Platform #3	27,300	27,300
MAF	Modifications of Manufacturing and Final Assembly Facilities for External Tanks	12,700	11,700*
KSC	Construction of Cargo Hazardous Servicing Facility	9,000	9,000
KSC	Modifications to Spacecraft Assembly and Encapsulation Facility (SAFE-2) for Cargo Processing	3,200	3,200
JPL	Construction of Frequency Standards Laboratory	2,700	2,700

Senator Garn—Continued

JPL	Modifications to Space Flight Operations Facility	1,600	1,600
ARC	Construction of Fluid Mechanics Laboratory	3,900	3,900
DFRF	Construction of Aeronautical Tracking Facility	800	800
LaRC	Modifications and Addition for Composite Materials Laboratory	5,100	5,100
LaRC	Modifications to 30- by 60-Foot Wind Tunnel	4,400	4,400
LeRC	Modifications for Small Engine Component Testing Facility	7,000	7,000
LeRC	Modifications to Icing Research Tunnel	3,600	3,600
VAR	Relocation of 26-Meter STDN Antenna, Spain	1,700	1,700
VAR	Repair	20,000	19,500
VAR	Rehabilitation and Modification	25,000	24,500
VAR	Minor Construction	5,000	4,800
VAR	Facility Planning and Design	10,000	9,200
VAR	Reimbursement to GSA for NASA Utilized Property at Ellington AFB	8,400	8,400

*Scopes and costs revised by NASA subsequent to submission to OMB.

A list of the projects not included in the FY 1984 request that were included in the NASA submission to OMB follows:

Loc	Project Title	Request to OMB ($000)
GSFC	Construction of Addition to Research Projects Laboratory	1,900
WFC	Rehabilitation of Technical Support Bldgs.	3,200

The following major projects are related to Shuttle operations:

Loc	Project Title	Original Request to OMB ($000)	Final Budget Request ($000)
JSC	Modifications for Additional Chillers for Mission Control Center	1,300	2,300
KSC	Modifications to Launch Platform #3	27,300	27,300
MAF	Modifications of Manufacturing and Final Assembly Facilities for External Tanks	12,700	11,700*

* Scopes and costs were revised by NASA subsequent to submission to OMB.

In addition to these projects, the budget line for Repair, Rehabilitation and Modification and Minor Construction include minor projects totalling some $4.7 million which are related to Shuttle operations. The amount in the budget request for these minor projects is the same as submitted to OMB.

All of the projects included in this request to support Shuttle operations are related to the flight rate.

Question: What is the current status of the modifications to the Space Flight Operations Facility at the Jet Propulsion Laboratory (JPL)?

Answer: The FY 1982 project, Modifications to the Space Flight Operations Facility (230), has been phased into 3 separate work packages with a total cost of approximately $1,800,000,000.

#1-Life Safety Modifications and Exits: The work was completed in December, 1982.
#2-Seismic and Fire Protection Mods: The work was awarded in March, 1983, and, is scheduled to be completed in September, 1984.
#3-Interior Modifications of Light Fixtures, HVAC Diffusers and Ceilings: Design is virtually complete. Construction is scheduled to start July, 1983, and be completed in September, 1984.

Priorities for Budget Reductions

Question: If the Congress were to reduce your FY 1983 Research and Development (R&D) amount by $20 million, how would you allocate this reduction--be pecific? Please prepare additional lists for reductions of $40 million, $60 million and $80 million.

Answer: The specific plan for taking a $20 million reduction would depend on the circumstances at the time and other related actions. In general, our intent in taking a reduction of this magnitude would be to avoid impacting any important schedules for flight projects, therefore, most of the reduction would be taken in small increments from areas such as research and analysis. Reductions of larger amounts would impact the development schedules for some flight experiments, most likely in the Science and Applications area involving the Spacelab payload program.

Question: If the Congress were to reduce your FY 1983 Research and Program Management (R&PM) account by $5 million, $10 million, $15 million or $20 million, how would you allocate these reductions--provide a breakdown by object class?

Answer: If cuts in Research and Program Management were imposed as stated, NASA would attempt to accomplish the required reductions to program operations in such a manner as to minimize the detrimental effects, especially on its civil service work force. In general, reductions would be made by delaying necessary maintenance and purchases, and reducing the level of travel (thereby impacting the adequacy of program monitoring), and curtailing personnel training, temporary and growth opportunity programs and the support service levels available to program operations. We believe that at the $5 and $10 million reduction level there will be minimal impact on the numbers of permanent civil service personnel. At $15 and $20 million in reductions, however, it probably will not be possible to accomplish all the cuts necessary without impacting the number of civil service personnel. Most impacted would be our plans to hire recent college graduates to invigorate the technical staff of NASA Centers.

The problems caused by the deferral of purchases are compounded by the direction we have received to absorb $16 million of increased FY 1983 pay costs. This can be accomplished only by deferring planned activities in FY 1983 into FY 1984, and trying to fit those and FY 1984 requirements into the funds asked for in FY 1984. As a result, any reduction will produce a cumulative effect that would be more severe than the isolated impact of such deferrals in any single year.

As noted above, NASA would try to accomplish any funding reduction with the minimum impact on its people as possible by delaying or deferring as many purchases as we can. In addition, it is almost impossible to predict where such delays and deferrals will be possible by object class because the requirements funded in each one will be individually reviewed, prioritized, and as many as possible deferred or delayed to accommodate the reduction imposed.

Question: If the Congress were to reduce your Construction of Facilities account by $10 million, $15 million or $20 million, how would you allocate these reductions?

Answer: The request for Construction of Facilities (CofF) funding is the result of a continuing negotiation process over many months between and among the NASA Centers, Program Offices, the Administrator and the Office of Management and Budget. If a significant reduction in the CofF proposed funding were to be made, the negotiation process within NASA would again be undertaken to realign the projects with the objective of postponing those projects that would be more adaptable to a short-term delay.

Question: If the Congress were to increase your Research and Development account by $20 million, $40 million, $60 million or $80 million, where would you apply these increases?

Answer: The two major areas which have been identified as requiring funding in FY 1984 above the amounts reflected in the budget request are Space Telescope development and the Space Shuttle Main Engine.

Question: If the Congress were to increase your Construction of Facilities account by $5 million, $10 million or $20 million, where would you apply these increases?

Answer: The request for Construction of Facilities is considered to be in proper balance with other portions of the budget request. If additional funding were available, it could be applied to repair, rehabilitation and modification, facility planning, minor constructions and to projects deleted during the OMB review process.

Unexpended Balances

Question: In your FY 1983 budget justification, you estimate an obligated, but unexpended balance at the end of FY 1982 of $1,842,124,000. Your FY 1984 budget justification shows that the actual amount was $1,096,699,000. How do you account for this almost $750,000,000 difference from your previous estimate?

Answer: The difference results from a number of factors involving changes in FY 1982. Approximately $191 million of fund availability from reimbursable orders was unobligated on September 30. Under our regular procedures, this unobligated balance has been examined and the funds authorized for obligation in FY 1983 as appropriate under terms of each uncompleted order. Approximately $347 million of funds appropriated for NASA programs in FY 1982 were unobligated at the end of fiscal year partially due to the program changes and delays relating to the urgent and general supplemental appropriation actions. All of these funds were programmed consistent with the FY 1982 Operating Plan, and most of the actions were in the procurement pipeline at the end of the fiscal year. Outlays in FY 1982 were over the amount shown in the FY 1982 column of the FY 1983 budget by approximately $200 million primarily because of outlays early in FY 1982 against funds carried forward from FY 1981. There was also relatively minor difference from the projected adjustment to expired appropriation accounts.

Private Sector Services

Question: How much money did NASA receive for services provided to the private sector in FY 1982? How much is estimated for FY 1983 and FY 1984? Could you please provide for the record a detail of these amounts by services rendered?

Answer: NASA received $291.9 million for services provided to the private sector in FY 1982. Estimated receipts for FY 1983 and FY 1984 are $296.2 million and $261.9 million respectively. The detail of these services follows:

	FY 1982	FY 1983	FY 1984
	($ in thousands)		
TOTAL	291,925	296,225	261,919
Space Transportation Systems and Operations	284,781	290,250	256,169
STS Operations Capability Development	20,282	31,250	9,369
STS Operations	50,000	91,200	143,200
Expendable Launch Vehicles	214,499	167,800	103,600
Space Science	3,813	25	---
Physics and Astronomy	1,027	---	---
Planetary Exploration	51	---	---
Life Sciences	66	---	---
Space Applications	2,669	25	---
Technology Utilization	48	3,150	3,150
Aeronautics and Space Technology	1,030	400	600
Space Research and Technology	31	---	---
Aeronautical Research and Technology	20	---	---
Energy Technology Identification	979	400	600

Tracking and Data Acquisition............	2,253	2,400	2,000

Headquarters Funding

Question: In FY 1982 your budgeted level for NASA Headquarters was $246,900,000. In FY 1983, Headquarters funding is expected to increase to $429,200,000 for an increase of $182,300,000 or 74 percent. Your FY 1984 estimate is for $612,600,000, this represents an increase of $183,400,000 from FY 1983 or 43 percent.

How do you explain these rather significant increases in NASA's Headquarters funding requirements over the last several years?

Answer: Most of the increase at Headquarters results from the increased payments to the Federal Finance Bank and the Tracking and Data Relay Satellite System. A lesser amount reflects funds carried in the Headquarters line prior to determination of the appropriate allocation to field centers.

Johnson Space Center Funding

Question: In FY 1982, your budget plan called for the funding of the Johnson Space Center (JSC) at $1,789,200,000. In FY 1983, you estimate the funding level at $1,723,300,000. Your FY 1984 estimate is for $1,596,200,000.

Please describe the programmatic changes that are expected to result in the $127,100,000 decrease from the FY 1983 level.

Answer: A summary by appropriation of the changes in JSC funding levels between FY 1983 and FY 1984 is as follows:

	FY 1982	FY 1983	FY 1984	FY 1983-FY 1984 Difference
		($ In Millions)		
R&D	$1,598.5	$1,524.9	$1,385.5	-$ 139.4
R&PM	186.5	195.2	204.6	+ 9.4
CofF	4.2	3.2	6.1	+ 2.9
TOTALS	$1,789.2	$1,723.3	$1,596.2	-$127.1

Research and Development (R&D) funding accounts for $139.4 million of the decrease. This is caused by a reduction of $149.1 million in Space Transportation

Capability Development programs, an increase of $17.7 million in Space Transportation Operations and a decrease in OAST/OSSA R&D programs of $8.0 million.

The decrease in Space Transportation Capability Development is largely due to a decrease in the Orbiter Production program reflecting one vehicle in flow in FY 1984, following the delivery of Orbiter 103 in September, 1983. This decrease is partially offset by an increase in the provisioning of Orbiter Spares lay-in including $100 million for the structural spares program. Orbiter flight spares and crew equipment spares also show an increase in FY 1984 due to the increase of flights from five flights in FY 1983 to nine flights in FY 1984.

The increase of $9.4 million in Research and Program Management (R&PM) includes $7.8 million for Operation of Installation, $1.3 million for personnel and related costs, and $0.3 million for travel. The Operation of Installation increases include rate increases for energy, support contracts, and administrative communications and the full year funding of support contracts.

The increase of $2.9 million in Construction of Facilities (CofF) includes $2.3 million for modifications for additional chillers for the Mission Control Center and miscellaneous repairs and minor construction.

Permanent Positions

Question: Page AS-12 of your budget justification contains a table listing the total number of permanent positions by NASA installation. That table shows that for each of your nine installations, the permanent position levels are the same in FY 1984 as in FY 1983. How do you account for the fact that while your program mix since FY 1983 has changed considerably, your permanent positions by installation remains unchanged?

Answer: The major shift in staff between programs at NASA, FY 1983 to FY 1984, results from the continued movement from the Space Transportation Capability Development to Space Transportation Operations as work on the Space Shuttle fleet and accompanying support is completed and phased into the operations phase of the program. This result is no change to the overall NASA civil service employment.

Question: Please present your OMB request for permanent positions for each of these installations.

Answer: The following table shows the request to OMB for permanent civil service personnel for FY 1984.

TOTAL NUMBER OF PERMANENT POSITIONS REQUESTED BY OMB

	FY 1984
Johnson Space Center	3,293
Kennedy Space Center	2,112
Marshall Space Flight Center	3,285
National Space Technology Laboratories	104
Goddard Space Flight Center	3,623
Ames Research Center	2,021
Langley Research Center	2,845
Lewis Research Center	2,479
Headquarters	1,457
Subtotal	21,219
Additional positions to hire newly graduated scientists and engineers	225
TOTAL	21,444

SES Bonuses

Question: How much have you included in your budget request for SES bonuses during FY 1984?

Answer: We have included $750,000 in the FY 1984 budget request for SES bonuses.

Total Shuttle Spare Parts Requirements

Question: Last year in our hearing, I asked you what the FY 1983 through FY 1985 total cost would be to establish your spare parts inventory. At that time, your inventory plan was based on procuring at least one of every functional line replacement unit by 1985. In response, you noted that it would cost approximately $130 million over that time period to implement this policy. You further noted, however, that various spares require more than a quantity of one to allow for normal expected failures in processing demands. You stated that when these are added, plus the costs of logistics, management and analysis to support that procurement, the total cost should be approximately $340 million through 1985.

How much have you budgeted for spares in FY 1983 and in FY 1984?

Answer: The budget for initial lay-in spares for the orbiter is $95 million in FY 1983 and $102 million in FY 1984. In addition, $20 million and $100 million is identified in FY 1983 and FY 1984, respectively, for orbiter structural spares.

Question: Based on your new spares procurement policy, what will be the new three year total cost? How many individual components are there on your spares list inventory? What percentage of these items have established mean time to failure data on which a replacement policy could be based?

Answer: The new three year total cost for orbiter spares (lay-in and operational) is $376 million which includes $76 million of costs in FY 1982 and prior. (This figure excludes the $120 million planned for structural spares during the same period.)

Listed below are the many individual components on our spares list inventory:

Orbiter	57,000	
SSME	540	
ET	80	
SRB/SRM	310	
KSC	63,182	GSE
TOTAL	121,112	Components

At the present, due to the limited flight experience, the orbiter program is not using actual mean time to failure (MTBR) data to establish replacement rates. At KSC less than 5 percent of the components have established mean time to failure date. MTBR data based on similar equipment items and in some cases test data are employed as a key consideration, however, in determining the spares lay-in requirements for orbiter line replaceable assemblies.

The SSME is in the process of establishing mean time to failure data on the latest configuration components. Considering the previous experience on the Columbia engines, it is estimated that 70 percent to 80 percent of the components have sufficient data to establish a replacement policy.

External tank and solid rocket booster utilize components from the production pipeline to satisfy line replacement unit spares requirements. Only small items such as transducers, connectors, etc. are layed in as spares.

Senator Garn—Continued

Solar Maximum Repair Mission

Question: The first demonstration of the Space Shuttle's ability to rendezvous with, retrieve and repair, a spacecraft in orbit is scheduled for FY 1984. Could you please bring us up-to-date on the status and cost of this mission and DOD's cost sharing contribution?

Answer: The Solar Maximum Repair Mission plans are proceeding on a schedule for the mission in April 1984. Critical elements such as the availability of the Manned Maneuvering Unit (MMU), the Manipulator Foot Restraint (MFR), the repair hardware, and the flight software are on schedule and should be available for a Flight Readiness Review in early April 1984.

The MMU will be put through a dress rehearsal on the STS-11 mission using a replica of the Solar Maximum Mission hardware to practice the delicate grapple and stabilization maneuver required of the MMU in the real mission. Special tools will also be tested on precursor missions to the Solar Maximum Repair Mission.

The total mission costs are presently estimated to be about $41 million, of which $29 million represents the recurring and nonrecurring space transportation costs related to the Solar Maximum Repair Mission. NASA is currently reviewing these costs with the USAF to determine the appropriate cost sharing for recurring costs as stipulated in the FY 1983 Congressional Authorization language. The USAF provided $2.0 million of FY 1982 funds and is expected to provide an additional $3.6 million in FY 1983.

Orbiter Main Engine Re-Use

Question: Your budget justification states that, "the performance of the main engines in their first five flights has validated the concept of a re-usable rocket engine having high thrust capability."

What is your current estimate for the number of flights per engine? What were your design estimates for the number of flights per engine during the development of the Shuttle? How do you account for the apparent decrease in longevity of the main engines?

Answer: Our original design estimates for the engine called for 55 flights per engine and we are still aiming at this target. Presently, the main engines are certified for ten flights. Additional life capability will be demonstrated in our ongoing flight certification extension ground test program. Flight engines on future orbiters will be changed out at staggered intervals to provide an early look at flight engines. The first of our new engines is planned to be removed after ten flights and subsequent engines increasing by five flight intervals, i.e., 15, 20, etc. Each engine after removal will be torn down and inspected for wear to assure no surprises occur in the flight program. The decision to change out the Columbia engines after five flights was based on a desire to get an early look at returned flight engines and to standardize on the full power level configuration engine for all orbiters, not because of a concern about longevity. Engine standardization will improve logistics support by having a common spares base and the early look at the Columbia engines should let us detect any flight associated wear problems at the earliest possible time, so that changes can be effected with minimum downstream impacts. Furthermore, the higher power level of the new engines gives us additional payload capability and improves our mission flexibility.

Modifications to Columbia

Question: The Space Shuttle Columbia is now undergoing a period of modification at the Cape to prepare the vehicle for the launch of the first Spacelab mission, planned for September, 1983. What is the current status of the modifications and how does the schedule and cost of these modifications compare to your prior estimates? Have you modified your plans to launch the first Spacelab mission in September?

Answer: The Spacelab modifications to the Columbia are progressing on schedule. The modifications were initiated in December, 1982 and are nearing completion. Following the completion of these modifications, the vehicle will begin a period of retesting to verify the changes that have been incorportated. OV-102 is projected to be ready to launch the Spacelab in late September, 1983. The FY 1983 Congressional budget contained $4 million to do a minimum modification of Columbia in order to fly STS-5. The "full-up" modifications at Rockwell's Palmdale facility were scheduled after STS-5. Subsequent to the budget, the decision was made to slip the full up modifications to FY 1985 and do the Spacelab modifications after STS-5. The estimate contained in the current operating plan for FY 1983 is $18 million for the Spacelab modifications.

We are currently continuing our planning to launch Spacelab in September, 1983. However, the recent problems associated with the placing of the TDRS-A in orbit may impact the Spacelab mission. A decision will be made shortly on the full range of mission options being studied as a result of the STS-6 problems.

Question: Your budget justification states that the Columbia will be modified to full operational configuration in FY 1985, although these modifications may be rescheduled for an earlier date.

Please list the major components and expected costs and schedule for this full modification. Have you re-thought the need to accelerate the modification of the Columbia?

Answer: We are still planning to modify OV-102 in FY 1985 and funds for this purpose are included in the FY 1984 budget runout. It is expected that the modifications will begin in January 1985 and will be completed in the late summer of that year. We do not plan to accelerate this schedule to an earlier date. Costs have been estimated at $45 million to complete the modifications.

Among the major modifications planned are the following:

- Removal of ejection seats and installation of operational seats
- Installation of the Head Up Display (HUD)
- Installation of Modular Auxiliary Data System (MADS)
- Structural beef-up in the mid fuselage and aft structure
- Densification of remaining undensified tiles

Shuttle Processing and Launch Capability at KSC

Question: You are currently phasing in the second line of vehicle processing stations at KSC to support the launch processing of two or more orbiters simultaneously.

Could you please provide for the record a description of major facilities required in order to support the Galileo and International Solar Polar Missions (ISPM) planned for 1986.

Could you also provide a estimate of the cost for each of these facilities?

Answer: The major KSC facilities that will be modified to support the Galileo mission and the International Solar Polar Mission planned for 1986 include the fixed and rotating service structures of Launch Pads A and B and Mobile Launcher Platforms one and two. Modification of the fixed service structure is required to provide local support for the addition of the Centaur rolling beam umbilical system and its cryogenic hydrogen piping and the control systems. The rotating service structure will be modified to provide satisfactory clearance for the rolling beam umbilical System and access to the orbiter/rolling beam umbilical interface. The Mobile Launcher platforms will require modifications to their tail service masts to provide additional gaseous helium and cryogenic oxygen service for the Centaur. Structural modifications are required for installation of the cryogenic oxygen piping and control system.

The total cost for modifying the KSC facilities for Centaur is estimated at $77 million with an additional $8 million estimated for accelerating PAD B nine months from its original operational readiness date of September, 1986, to January, 1986, to accommodate the Centaur launches. Facility modifications costs are estimated as follows:

	$ in Millions
Design and Engineering Services	$17
Pad A	25
Pad B	20
MLP 1 and 2	5
Facility Validation	4
Equipment	15

Space Shuttle Spares

Question: Your budget justification notes that "the Administration has authorized the inclusion in this budget request of the amounts required to procure extensive spares to insure the operational viability of a four-orbiter fleet." Your justification goes on to further state that the "initiation of procurement is planned for FY 1983."

Does this imply that you have changed your procurement plans for FY 1983, and if so, what changes will you have to make in your FY 1983 Operating Plan?

What criteria have you established for the use of the $100 million for spares procurement included in your FY 1984 budget?

Senator Garn—Continued

How much money had you budgeted for engine spares in FY 1983?

Answer: We have not changed our FY 1983 procurement plans at the present. We are examining the program to determine the possibility of making up to $20 million available to procure structural spares.

Our present procurement plan and operating plan supports the procurement of extensive spares to insure the operational viability of a four-orbiter fleet. In FY 1982, $58 million was spent for initial lay-in of spares. In FY 1983 our operating plan is $94.9 million -- a substantial increase.

The $100 million will be used for those items which are not planned to be procured in the spares program that will insure the long-term viability of the four-orbiter fleet. These spares will provide the capability to substantially reduce downtime for an orbiter by providing the capability to repair or replace structural components in the event of damage to those components. These items are major structural assemblies such as the wings, aft fuselage, crew module, mid fuselage, vertical tail, and the orbital maneuvering system. These assemblies would be completed up to the point where they would be ready for installation of the various electrical, thermal, hydraulic, and propulsion systems.

Question: Based on your experience with the Columbia launch this month, do you believe it is necessary to devote a larger proportion of your funds to assure the availability of an adequate supply of orbiter main engines?

Answer: Engine spares in FY 1983 were budgeted at $85.0 million. Our engine experience with the Challenger has pointed out the need for additional spares. Because of the leak problems on Challenger's engines and its spare, it was found that one backup spare per Orbiter flight set was not always sufficient. We have recently taken steps to accelerate engine and component deliveries to the maximum extent possible and are developing improved control systems to assure the acceptability of the products delivered. Improving our spares posture will require reallocation of funds in FY 1984 and a high priority for these activities in subsequent year budgets; the need for any funds will be fully assessed during the preparation of the FY 1984 Operating Plan and FY 1985 budget.

Teleoperator Maneuvering Vehicles

Question: One of the activities that you intend to undertake during FY 1984 is the preliminary definition of Teleoperator Maneuvering Vehicles. These vehicles are designed to transport spacecraft or space structures from one orbit to another.

What specific design consideration of constraints have you identified relative to a Teleoperator Maneuvering Vehicle?

How much money do you intend to allocate for this activity during FY 1984?

Given your current plans, when would you expect such a vehicle to be available for actual use?

What is the expected cost associated with the development of such a vehicle?

Answer: The Teleoperator Maneuvering System concept definition has resulted in a proposed approach for a vehicle which could transport satellites weighing upwards of 10,000 lbs. altitudes in excess of 1,000 n.mi above that of the orbiter. This concept would also provide the capability to change the plane of the orbital inclination up to 6 degrees with a payload of 1,000 lbs. Its design would be modular, so that it could readily grow to reach altitudes of 2,000 miles or plane change angles of 11 degrees.

The FY 1984 budget request does not provide for the detailed definition (Phase B) studies to be undertaken. We may propose the reallocation of funds for this purpose after a review of the STS program funding requirements during the formulation of the FY 1984 Operating Plan. At present, however, the amount of funding for continued studies included in the budget is $500,000.

The Teleoperator Maneuvering System -- if proposed and approved as an FY 1985 new start -- could be available for initial flight by late 1987 or early 1988.

The initial estimate based on preliminary definition studies is on the order of $200 million for a vehicle with placement and retrieval capability, and designed to be modular for future growth. This is a very preliminary estimate since detailed definition and independent cost evaluations have not been completed.

Delivery of Fourth Orbiter and Air Force Requirements

Question: The delivery of the fourth orbiter is slated for December, 1984. Your budget justification states that it is necessary to maintain this delivery date in order to meet the initial operational capability date for the Vandenberg Air Force Base launch site. Your budget further notes that the expected operational date for Vandenberg is October, 1985.

Is this still the Air Force's best estimate for the availability of Vandenberg?

How soon before the Vandenberg becomes operational is the fourth orbiter required?

If the Vandenberg date was slipped until January, would this cause you to re-think the scheduling requirements for OV-104?

Answer: The Air Force estimate for the initial operational date for Vandenberg Air Force Base Shuttle launch site remains October, 1985.

OV-103 has been identified as the orbiter vehicle to be utilized for the VAFB launches. OV-103 will be delivered to KSC in September, 1983, and will be launched on its first mission in early 1984 after it goes through its checkout process. OV-103 will be used to carry out missions throughout 1984 and early 1985 and will be transferred to VAFB in early 1985. Prior to that time, OV-101, the approach and landing test vehicle, will be used as a "pathfinder" vehicle to verify VAFB facilities and vehicle processing procedures. The fourth orbiter, OV-104, will be delivered in December, 1984, and will replace OV-103 in the KSC vehicle inventory.

A several month slip in the VAFB initial launch date to January, 1986, would not be cause for a similiar slip in the OV-104 delivery. The cost involved in delaying this vehicle would be significant and would also disrupt current manifest planning.

Criteria for the Procurement of Spares

Question: In describing your spares procurement policy, you note that "maintenance requirements analysis for line replacement units are underway at the prime contractor's plant and at subcontractors' facilities. These analyses are based on test and flight experience and form the basis for deciding the timing of the spares procurements."

To what extent is your spares procurement policy being driven by the test and flight experience data and your estimates of mean time between failure versus your policy to insure long term operational viability of the four-orbiter fleet by providing major structural components in the event of damage?

How much of the spares money in your FY 1984 budget is based on test and flight experience data and how much is based on the decision to secure additional large structural components, such as crew module, mid and aft fuselage sections, payload bay doors, etc.?

What is the production lead time associated with each of the major structural assemblies that you intend to procure during FY 1984?

Answer: At the present our spares procurement policy is based on both test and flight experience data as well as insuring the long term operational viability of the four-orbiter fleet by providing major structural components in the event of damage. We did not impact the basic flight spares program in order to implement the structural spares program.

Of the total of $267.7 million for orbiter spares in FY 1984, $100 million is for structural spares and $167.7 million is for flight/GSE lay-in and replenishment including the logistics management and analysis.

Through the completion of secondary structure the production lead times are as follows for the major structural assemblies:

Aft Fuselage - 41 months
Crew Module - 47 months
Lower Forward Fuselage - 37 months
Vertical Stabilizer/Wings - 46 months
Mid Fuselage - 29 months
OMS PODS - 53 months
Forward RCS Module - 33 months
Upper Forward Fuselage - 41 months

Manned Maneuvering Unit

Question: What is the status of your development of the Manned Maneuvering Units? When is the first expected use of these maneuvering units? What is your best, current estimate of the total development and fabrication costs of these units and how does this compare to your estimated costs of two years ago?

Answer: The Manned Maneuvering Unit (MMU) development is complete with the exception of a redesign and certification of the orbiter interface hardware. The redesign was necessary due to higher vibration loads during ascent and entry than the MMU was originally designed to withstand.

The first expected use of the MMU's is on STS-11.

The current estimate of the total development and fabrication costs of the one qualification test unit and the two flight units is $71 million. The estimated cost is largely due to the vibration redesign. The redesign of the flight support station backbeam, the orbiter interface backbeam and the associated certification testing resulted in an approximate one year slip in delivery of flight hardware.

Question: Please provide a description of the performance specifications for these units for the record.

Answer: For the record, we are submitting a single page summary of the performance requirements and a copy of the MMU Users Guide. (Enclosures 1 and 2)

Shuttle Training Aircraft

Question: Your FY 1984 budget contains funds for the procurement and modification of a third Gulfstream II for use as a Shuttle training aircraft.

How much money is included in your FY 1984 budget for procurement and how much is included for the modification of the Gulfstream II?

How much is the total procurement and modification costs for this third Gulfstream?

When will the aircraft be available for use as a training aircraft given your current schedule and plans?

Answer: In FY 1984, $7.0 million was budgeted. Our current plan is to purchase an aircraft in FY 1983, at a notable savings to the Government. In this approach, FY 1984 funding will be at a level necessary to carry out tasks the major modifications planned for FY 1984 and FY 1985.

The total procurement and modification costs for the third Gulfstream is $27.2 million for all years.

STA-3 will be ready for training in late FY 1985.

Question: Please provide for the record the number of flight hours on for the first and second Gulfstream II currently at use at NASA during FY 1982 and your expected number of flight hours for training on each of these aircraft during FY 1983.

Answer: FY 1982 Flight hours on 2 STA's were 1200 hours total (1,032 orbiter training plus 168 other).

FY 1983 flight hours projected for 2 STA's are 1,200 hours.

Question: Please also provide for the record the number of hours of maintenance on each of the Gulfstreams during FY 1982 and the expected number of maintenance hours during FY 1983.

Answer: Maintenance time on 2 STA's in FY 1982 was 30 weeks (28 weeks scheduled plus 2 weeks unscheduled).

The FY 1983 estimate is also 28 weeks of scheduled maintenance.

Question: Based on the above data, how much available time is unused on each of the Gulfstreams?

Answer: FY 1982: None
FY 1983: None

Shuttle Inventory Management System

Question: On Page RD-1-16 of your budget justification, you note that one of the reasons for an increase in your FY 1983 current operating plan from your FY 1983 budget estimate is an increase in funding requirements for the Shuttle Inventory Management System. Could you please describe the nature of this inventory management system, how much of the additional $1.2 million will be applied to this activity during FY 1983 and what specific augmentations to the inventory system would be expected?

Answer: The Shuttle Inventory Management System II (SIMS II) is the automated data processing system which is being designed to support NASA and USAF logistics requirements, i.e., insuring that spare parts, supplies and materials are available as needed to support the Shuttle program at both KSC and Vandenberg launch sites. In addition to controlling the location and movement of material to support Shuttle and cargo ground support equipment, flight hardware and requirements of other R&D projects, it will also be capable of supporting institutional requirements. NASA selected Computer Sciences Corp., Falls Church, Virginia, and awarded a firm fixed price contract in August, 1982, for development of SIMS II.

SIMS II is best characterized as a multi-user, multi-site inventory management system that offers compatibility with NASA's concept of conducting operations in the near future with self-sufficient contractors such as the Shuttle Processing Contractor, Base Operation Contractor, Cargo Processing Contractor and DOD. Each contractor or user will be responsible for his own logistics support while the Government retains its inherent responsibilities and visibility. The estimate for FY 1983 was revised upwards by $4.2 million to reflect the result of contract negotiations for SIMS II. This SIMS II increase is included in the net $1.2 million FY 1983 increase for launch and mission support activities described on Page RD-1-16.

Launch and Mission Support Activities

Question: In describing your FY 1984 activities under your launch and mission support Program, you note that funds will be spent on your Mission Control Center upgrading at Johnson Space Center and funds will also be used to complete the flight control room on the second floor of the Mission Control Center.

Could you please describe the activities that will be funded through your Space Transportation Capability Development program in these areas?

Why are you not requesting that these funds be made available from your Construction of Facilities account rather than your Research and Development account?

Answer: Completion of the flight control room (FCR) is an activity included in the Mission Control Center (MCC) upgrading. Completion of the FCR involves upgrading the second floor of the MCC to support 2-vehicle mission operations in FY 1984. The upgrading includes hardware installation and reconfiguration, and software development and reconfiguration. Similar activities are required to upgrade the MCC to accommodate launch and landing support at Vandenberg Air Force Base and a 3-vehicle capability.

No major Construction of Facilities is involved. The area on the second floor where the new FCR is being located is the same area where the old FCR was located to support STS-1 through STS-4. The old FCR was called the Mission Operations Control Room.

Shuttle Propulsion Systems

Question: In describing your FY 1984 program under Shuttle propulsion systems, you note that "It was decided that flight operations costs should reflect only the main engine spares required to place units which had reached the established limits on their flight operations times; formally these established mean times before replacement estimates had been multiplied by a factor of two to insure that sufficient spares were budgeted for operations." You further note that the effect of this decision was to increase by $30 million this budget element and decrease by $30 million your current estimates for Shuttle Operations.

What impact, if any, will the shifting of costs from flight operations to capabilities development have on your pricing policy?

Why do you think that such an accounting change is beneficial -- does it tend to obscure the actual flight operations cost of Shuttle?

Answer: Previous Shuttle Operations estimates for the main engine were based on the projected funding required to support two major activities: anomaly resolution testing and flight replacement spares. Anomaly resolution testing included both test stand usage and the engineering support to that testing. It was recognized in the budget process that the continuing development and certification testing will occupy all test stand time--except for acceptance testing of flight production hardware--and any operations anomalies that occur would be tested using development engines. Accordingly, NASA management decided that it was more practical for all development/certification/anomaly resolution testing to be funded on a consolidated basis. The second major element is the acquisition of spares for replacing flight engine components which have failed or are scheduled for maintenance. Previously, the estimates were predicted on buying twice the number of spares actually estimated as being required for replacement. In effect, the second set of spares amounted to an on-going lay-in of spares. In the other program elements, such as the orbiter, the spares estimates are based on replacement requirements and the procurement of the lay-in spares is funded under Shuttle Production and Capability Development. NASA management determined that this groundrule should apply to the main engine program.

In NASA's view, these changes to the manner in which program requirements are funded are defensible and provide a more realistic accounting of the actual costs of Shuttle operational flights.

Space Shuttle Changes in Systems Upgrading

Question: In your FY 1983 budget, you requested $72,500,000 for Space Shuttle Changes and Systems Upgrading. Your current FY 1983 Operating Plan calls for the use of $25 million for this purpose, in describing this $47.5 million decrease in your FY 1983 plan, you note that $10 million was part of the Agency's overall response to the general reduction made by the Congress and NASA's FY 1983 appropriation request. An additional $37.5 million was reallocated to Shuttle production in capabilities development.

What specific programs or activities did you have planned in FY 1983 that will not be accomplished because of the reduction and/or reallocation of this $47.5 million?

For FY 1984, you are requesting $52.7 million for Changes and Systems Upgrading. Your budget justification contains only three lines describing the types of activities that might be undertaken during FY 1984. Could you please describe, for the record, the specific activities that will be undertaken during FY 1984 and the estimated costs associated with each of these activities?

Answer: The Changes and Systems Upgrading budget estimates represent an allowance or reserve for potential changes and systems modifications and unanticipated developments not provided for in the program element budget estimates. This funding allowance is to provide for those programmatic and technical changes which will improve system reliability, increase operating efficiencies and/or reduce costs. Specific items to be funded from this budget are identified primarily as a result of actual flight or test experience. The $37.5 million reallocated to Production and Capability Development in FY 1983 was to accommodate changes of that nature, including: initiation of work on the third mobile launcher platform; the addition of a fifth cryogenic tank to extend the first Spacelab mission on-orbit time; long lead main engine hardware and critical components to replace hardware lost during engine test incidents; and the initiation of a new main engine controller development.

The FY 1984 budget request for Changes and Systems Upgrading of $52.7 million is to provide for those types of potential changes described above. While there are not yet definite activities identified for these funds, it is anticipated that the problems experienced on STS-6 will lead to programmatic and technical changes on the main engine program that will require reallocation from the Changes and Systems Upgrading allowance.

Centaur Engine Development

Question: How much money have you allocated in FY 1983 for work required on the RL-10 engine used in the Centaur? What specific types of upgrading are you pursuing on the RL-10? Are there any funds in FY 1984 budget for the continuation of work on the RL-10 engine?

Answer: Approximately $6 million has been allocated in FY 1983 for the RL-10 engines for the Centaur-G and Centaur G-Prime vehicles, and another $5 million for the RL-10 "Product Improvement Program." Outside of requalifying the engine for a change in propellant mixture ratios, no engine upgrading is required for the Centaur-G and G-Prime program. NASA however, is pursuing a "Product Improvement Program" (PIP), as NASA has periodically done during the past 20 years with the RL-10 engine. This effort encompasses increasing engine performance through use of extendable nozzles and low thrust qualification for use in transfer of future acceleration-sensitive payloads from low earth orbit.

Approximately $7 million is included in the Centaur budget in FY 1984 for continuation of the RL-10 engine development and production for the Centaur-G and Centaur G-Prime vehicles. The scope of the FY 1984 PIP activity is currently under review.

Spacelab Instrument Pointing System

Question: One of the last major elements of the European Space Agency Spacelab development to be delivered to the United States will be the Instrument Pointing System.

What is the current status of the Instrument Pointing System, when do you expect delivery and what is the total expected European costs associated with the development of the pointing system?

What was the delivery date that you were shooting for last year?

Answer: The Instument Pointing System (IPS), being built by Dornier Systems of Friedrichshafen, West Germany, has advanced to a state wherein all component parts and subsystems are now undergoing testing and will shortly be integrated into a system. Simulation results indicate that the system should be able to meet and, in some cases, exceed its performance specifications. The total expected European development cost is estimated to be approximately $70 million at completion.

Last year the Spacelab program was working to an Instrument Pointing System delivery date of December, 1983. Delivery is now expected to be in April, 1984.

Spare for European Space Agency Flight Hardware

Question: On page R&D-129 of your budget justification, you note that funding is also required for the initial lay-in of spares for the ESA-delivered hardware and to provide the sustaining engineering for all hardware and software beyond that for which ESA is committed.

Please describe in more detail the types of spares and the expected cost of these spares over the life time of this ESA-furnished flight hardware.

How much have you earmarked for this initial "lay-in" during FY 1984?

Answer: The spares covered by the FY 1984 budget request are those necessary to support two full sets of ESA-delivered flight and ground support equipment (GSE) hardware. Beyond those spares provided by ESA for development flights, the request provides initial and replenishment flight and GSE line replaceable spare units (and components, where applicable) for the program through FY 1988, at a total cost of approximately $68 million.

$6.4 million of this figure is earmarked for initial "lay-in" during FY 1984.

Space Shuttle Engineering and Technical Base

Question: In describing your Space Shuttle engineering and technical base program, you note that you are able to reduce the new budget authority associated with your research and test support from your originally budgeted $34.9 million to $29.6 million. In describing the reason for this decrease, you indicate that there was a carry-over from FY 1982 that would be used to offset this reduction. Do you anticipate any carry-over in FY 1984?

Answer: The carry-over of $12.1 million for the total engineering and technical base program from FY 1982 to FY 1983 was the result of several planned actions such as manpower reductions and reduced procurements of supplies and materials as discussed in our budget justifications. These actions made obligation authority available to carry-over and apply to FY 1983 requirments. This carry-over was considered in developing the FY 1983 requirements for new obligation authority. There are no similar actions being undertaken in FY 1983 which would result in a reducation in our FY 1984 request.

Space Shuttle Advance Programs

Question: In describing your manned systems, tests and engineering activities in your Advanced Programs for the Space Shuttle, you note that prototype development simulation and tests will be implemented to investigate the utility and efficiency of a new manned extra-vehicular and teleoperated systems.

To what extent could the teleoperator and manned extra-vehicular programs be combined into one system?

Has NASA done any studies to identify the potential cost benefits associated with such a combination?

Answer: We are studying both extra-vehicular (EVA) manned systems and teleoperated systems. The manned EVA systems will see greatest application for servicing, refueling, and other operations using the Shuttle orbiter. The teleoperated systems are designed to allow the remote extension of man's eyes and reach to thousands of miles away, or even to geostationary orbit. Man's presence is not required for the satellite placement and retrieval functions, and many servicing functions can also be performed well by remote control at any altitude. Thus, the bulk of currently identifiable needs for the near term can be satisfied with teleoperated systems. It is conceivable that manned sortie missions will eventually be needed. But they represent separate developments of vastly differing complexities and should not be combined.

NASA has studied the operational benefits of manned and teleoperator hybrid systems for shirt-sleeve operations in which no constraints were imposed by the operational use of such a system for remote handling, assembly, and maintenance operations. Operational requirements for such systems were the primary drivers for design considerations goal. No potential cost benefits were identified over options in which both were acquired separately since the manned system is the cost driver in either case.

Tethered Satellite System

Question: In describing your activities relative to the U.S./Italian joint effort to develop a Tethered Satellite System you note, "It is our understanding that the Italian Government has authorized all funds necessary to complete the development and flight of the satellite." Is that still your understanding and what assurances do you have that these funds will be available?

Answer: The Italian Government has approved and committed the equivalent of about $40 million in their current five year plan for the Tethered Satellite System (TSS) which is consistent with the funding estimate for the satellite development and flight. The Italian participation in and completion of the TSS program will be confirmed in a Memorandum of Understanding (MOU) now being drafted between the U.S. and Italy. The MOU will be signed by the Minister of the Scientific Research and Technology for Italy and the NASA Administrator for the U.S. In addition, the MOU will be formally endorsed by both Governments through the exchange of diplomatic notes. The MOU will be signed after the funding for the United States portion of the program is approved by Congress.

Question: You have requested $3.3 million for the initiation of hardware development for the Tethered Satellite System in your Space Shuttle Capabilities Development program. Why have you requested funding for this program in your Space Shuttle Capabilities Development program rather than in your Environmental Observations program?

Answer: The Tethered Satelite System (TSS) consists of two major components. The first is the satellite which will be deployed up to 100 km above or below the Shuttle and maintained in a stable position by the deployer mechanism. The second major component is the deployer which includes the Tether, reel mechanism, deployment boom, and associated control electronics. The Tether Deployer is being developed as a Shuttle facility which can be used for a number of future applications beyond the initial two science missions included in the U.S./Italian cooperative effort. These two missions will develop data on the important atmospheric processes occurring within the lower thermosphere and the electrodynamic interactions within the space plasma respectively. The two missions will also demonstrate the stable operation of payloads tethered from the orbiter. The satellite for the first two missions is being developed by the Italians who will also be responsible for the integration of U.S., Italian, and other foreign experiments into the satellite. The U.S. part of this cooperative program is to develop the Tether Deployer and to fly the two missions on-board the Shuttle. Therefore, the U.S. portion of the Tethered Satellite System, since it is a development of a new Shuttle facility, is included in the Space Shuttle Capabilities Development program.

Space Shuttle Pricing Policy

Question: The Space Shuttle provides launch services to non-NASA users on a reimbursable basis. The amount paid by such is related to the size of the payload and the services required, for flights through FY 1985, the computation is based on a full mission cost for standard launch services of $18 million per flight in 1975 dollars. For flights during FY 1986 to FY 1988, the charge will be increased to $38 million in 1975 dollars, or approximately $71 million in FY 1982 dollars. For DOD, the rate would be $16 million in FY 1984 and FY 1985 and $29.8 million in FY 1986 to FY 1988. Please provide a copy of the MOU between NASA and the Air Force for the record.

Answer: The requested Memorandum of Agreement between NASA and the USAF is attached. (Enclosure 3)

Space Shuttle Spares and Equipment

Question: For FY 1983, you have $323,000,000 budgeted for Space Shuttle spares and equipment. How much have you requested for spares and equipment in your FY 1984 budget?

Answer: Starting with the FY 1984 budget, the specific elements of the spares and equipment requirements are included in the project elements of the Shuttle Production and Capability Development, that is, orbiter, propulsion systems, and launch and mission support.

The estimates for FY 1984 in our budget request for content equivalent to that of the spares and equipment project is approximately $417 million.

Senator Garn—Continued

Question: Please prepare a table for the record comparing FY 1983 and FY 1984 estimates associated with each of your major categories of spares and equipment.

Answer: Listed below is a table comparing FY 1983 and FY 1984 estimates associated with each of our major categories of spares and equipment:

	Budget Estimate for FY 1983	Budget Estimate for FY 1984
	$323,000,000	$416,900,000
Orbiter Lay-in Spares	115,200,00	102,000,000
Orbiter Structural Spares	-	100,000,000
Engine Production Spares	23,700,000	38,400,000
SRB Tooling	33,000,000	44,000,000
ET Tooling	115,600,000	83,000,000
Crew Equipment Lay-in Spares	34,000,000	35,600,000
Launch Site Lay-in GSE Spares	1,500,000	1,200,000
Operations Integration Equipment	-	12,700,000

Space Shuttle Flight in FY 1984

Question: Your budget justification indicates that you expected to fly from eight to nine Space Shuttle missions in FY 1984. Your justification further notes that the number of flights will depend "upon re-flight requirements and identification of new initial requirements."

Given your most current flight manifest, how many flights do you anticipate in FY 1984?

How many do you anticipate in FY 1983?

Will the delays associated with STS-6 impact the FY 1983 and/or FY 1984 anticipated flight rates?

Answer: Nine flights are anticipated in FY 1984.

Three more flights are scheduled for FY 1983 in addition to the two already accomplished.

Current planning is that STS-7 and STS-8 be launched on accelerated schedules using Challenger, which will allow STS-9 (Spacelab 1) to be launched on schedule on the Columbia. No significant delays are currently planned in FY 1984 flights as a result of the

STS-6 delay. However, the current plans assume that an acceptable TDRSS capability will be achieved in time to permit Spacelab 1 to be flown on September 30, 1983. These plans are being reassessed as a result of the TDRS problems encountered after deployment on STS-6.

Space Shuttle Launch Rates

Question: The report further identifies "bottlenecks in the system" associated with the Vehicle Assembly Building, mobile launcher platform and launch pads.

To what extent does NASA consider these facilites at Kennedy Space Center to represent real constraints on the flight rate?

What is your current cost estimate for the additional facility and tooling that would be required to service a five orbiter fleet?

Answer: The facilities available at the Kennedy Space Center (KSC) limit the flight rate capability at specific levels for various corresponding processing facility "bottlenecks." Depending upon turnaround time assumptions, the KSC launch rate is limited to 14 or 15 launches per year with one launch pad. However, funding for the construction and equipping of a third mobile launcher platform and second launch pad is included in the budget to provide for the higher launch rates corresponding to about 24 per year overall (18 from KSC) for the four orbiter fleet. The existing two vehicle assembly cells are currently assessed as being able to support a launch rate at KSC of 30 launches per year.

We have not identified any additional facility and tooling requirements at this time to service a five orbiter fleet. Increased facility and tooling requirements of this nature are driven by the flight rate and not necessarily driven by an additional orbiter. Adequate support to the 24 per year flight rate is contained in the FY 1983 budget request, i.e., two OPF bays, two vehicle assembly bays, two launch pads and three mobile launcher platforms. To exceed 24 flights per year, it may be necessary to provide additional support facilities. For example, in order to support a total of 30 launches per year (24 at KSC), our preliminary estimate of additional funding requirements is approximately $380 million beyond that contained in the FY 1984 budget runout. These funds would provide improvements to Launch Complex 39, the OPF Annex, solid rocket motor processing facilities and additional external tank and solid rocket booster facilities and tooling at all locations. It should be noted that this does not include the cost of OV-105 and any facility or R&D costs for an solid rocket booster refurbishment and subassembly facility.

Question: The National Academy report makes reference to the possible requirements for a fourth and fifth mobile launcher platform, a fourth firing room, a third Vehicle Assembly Building integration cell, an additional 747 and an additional runway at Kennedy.

Was the need for these facilities considered in arriving at your cost estimate?

At this point in the record, I would like to place a copy of the Academy's report and also have you provide your comments for the record.

Answer: The need for these facilities was considered but was not included in the FY 1984 budget request. The fundamental question to be answered is whether the demand for additional Shuttle launch capability will materialize which would warrant the investment in the orbiter fleet and supporting facilities and equipment.

The National Academy report generally appears consistent with the NASA thinking of what would be required to support an augmented flight rate, on turnaround capability concerns and facilities needs. The planned three mobile launchers (MLP's), two firing rooms plus one software development room, two VAB integration cells, one 747 carrier aircraft, and one runway at KSC are estimated to be capable of supporting a total launch rate approaching 30 per year (24 at KSC). The total launch rate increase from 30 to 40 per year may require addition of these facilities or others, or the increase may be achievable by reducing the turnaround times.

Status of Vandenberg Air Force Base Shuttle Launch Complex

Question: Your budget justification states that "NASA will also continue to support the Department of Defense's development of the west coast launch site for the Space Shuttle," leading to an initial operational capability in late 1985.

What is the status of the activities at Vandenberg Air Force Base and what major items still remain to be completed?

What is the most recent cost estimate for the total Vandenberg program?

What costs contribution, if any, does NASA intend to make towards the development at Vandenberg during FY 1984?

What is your current estimate as to the expected orbiter turnaround time at Vandenberg versus the expected turnaround time at the Cape?

Answer: It is NASA's understanding that the activities are on schedule.

The most recent data available to NASA is that the costs to activate Vandenberg as a Shuttle launch site are on the order of $2.8 billion.

NASA has budgeted $3.1 million in FY 1984 for systems integration support for Vandenberg. NASA is responsible for all vehicle system integration costs. In addition, NASA contributes the manpower cost of civil service required to support the design, acquisition and installation of KSC/VAFB common and modified common ground support equipment.

The currently assessed projection for KSC turnaround activities is 37 work days (assuming processing five days per week on a three shift basis). Using the same groundrules, the projected turnaround time for an orbiter at VAFB is approximately 43 days. Different facility arrangements and operating practices between the two launch sites result in the difference in projected turnaround. Not considered in these estimates are a series of proposed changes and processing refinements that have not yet been approved within the KSC system that could lower the turnaround time from 37 days to a potential 28 days.

Changes In Estimates Associated with the Space Transportation Systems' Reimbursable Program

Question: In this year's budget justification, you indicate that under your reimbursable program the Space Transportation Systems Operations resulted in a program level of $373,947,000. In last year's budget justification, your estimate for this program level was $179,200,000. How do you account for this significant difference?

Answer: The significant variance between the 1982 estimate of $179,200,000 in last year's budget and the 1982 actual of $373,947,000 in the FY 1984 budget is primarily attributable to the changes in the budget structure incorporated in this year's budget.

Senator Garn—Continued

The $373,947,000 actual for FY 1982 is for the Space Transportation Operations line item which is composed of Space Shuttle Operations and expendable launch vehicles. The $179,200,000 estimate in the question represents the FY 1982 estimate provided last year for the Space Flight Operations budget line item which included Shuttle Operations and operations capability development programs but excluded the expendable launch vehicles.

Last year's FY 1982 estimate, put on an equivalent program content basis to the current Space Transportation Operations, would have been $335.1 million compared to the FY 1982 actual of $373.9 million for an increase of $38.8 million to last year's estimated expendable launch vehicle reimbursements and a lower than planned reimbursement of $12.5 million for Shuttle Operations standard services.

Question: In this year's budget you estimate that the FY 1983 level for Operations will be $451,600,000. Last year you estimated your FY 1983 program at $357,200,000. How do you explain this large change in estimates?

Answer: The variance in FY 1983 reimbursement estimates from last year to this year is attributable to the change in budget structure discussed in the answer to the previous question.

The FY 1983 estimate in last year's budget, when adjusted for comparable content to the current FY 1983 estimate, equals $396.0 million. The current FY 1983 estimate of $451.6 million reflects increased reimbursement estimates of $19.0 million for Shuttle Operations standard services and $36.6 million for expendable launch vehicles.

Question: For FY 1984, you are estimating a Operations budget of $473,400,000. How did you arrive at this estimate? How many flights was this based on and what is your best current estimate as to the number of flights?

Answer: The FY 1984 estimate for Space Transportation Operations was based on the estimated requirements of the current Shuttle and expendable launch vehicle flight schedule and hardware lead times considering the projected reimbursement revenues. The Shuttle Operations estimates were based on the following flight model:

Senator Garn—Continued

	FY 1983	FY 1984	FY 1985	FY 1986
Number of Flights	5	9	13	16

The Shuttle flight model and associated manifest will be updated during the FY 1985 budget process. An adjustment in the number of flights in FY 1985 is likely in consideration of the status of the Space Telescope project.

Question: Your FY 1984 budget justification indicates that your program level for STS capabilities development in FY 1982 was actually $177,680,000. In your FY 1983 budget justification, you estimated a level of $681,000,000 for this program element. How did you account for this over $500 million difference?

Answer: The FY 1982 reimbursement estimate in the FY 1983 budget stated as $681,000,000 for the Space Shuttle line item, which included Shuttle Development and Production activities, was, in fact, an error as was discussed with your staff. The estimate should have read $116.7 million.

The current Space Transportation Capability Development line item includes all Space Transportation program activities except Shuttle Operations and expendable launch vehicles. The FY 1982 actual for these program activities in our current budget is $177,680,000. A comparison with the FY 1982 estimate in last year's budget, when adjusted to include comparable program content to the current Space Transportation Capability Development budget, would have been $233.4 million. This equivalent estimate includes the corrected Shuttle value ($116.7 million) plus it incorporates the reimbursement estimates for the other program activities in the Capability Development budget, etc., which were previously included as a part of the Space Flight Operations line item.

The decrease of $55.7 million from the 1982 estimate provided last year ($233.4 million-$177.7 mission actual) was previously a result of lower than planned reimbursements in the Shuttle development and payload operations support activities.

Space Transportation Systems R&D Budget for Goddard Space Flight Center

Question: On Page SUM-17 of your budget justification, you present a breakdown of your program funding by installation and fiscal year. That chart shows that for your Office of Space Transportation Systems Operations, Goddard Space Flight Center, was budgeted at $27,600,000 for FY 1982; $81,400,000 for FY 1983 and $49,400,00 for FY 1984. How do you account for the large increases in FY 1983 over the FY 1982 level and the subsequent reduction in FY 1984?

Answer: The program funding breakdown by installation and fiscal year for the Goddard Space Flight Center is related to the direct funding requirements for projects under the Office of Space Flight previously the technical management of the Delta. In late FY 1982, the Delta production and launch program was impacted severely by reimbursable customers decisions to opt for Shuttle launch availability or to use the Ariane launch vehicle. These decisions required an adjustment in Delta funding in FY 1983 for which we requested a reprogramming action, increasing the direct funding requirement by $40 billion. This adjusted plan consists of a reduction of the number of Delta vehicles being procured and a phase down of launch support as soon as practical to support the needs of firm user requirements through 1986.

Delta Expendable Launch Vehicles

Question: Since your budget justification states that "the Shuttle's unique capabilities will not only lower the cost of space operations but will also lead to savings in the costs of payloads. The advantages offered by the Space Transportation System over existing expendable launch systems will enhance both the flexibility and productivity of space missions." I would expect that it would be no problem for the Shuttle to compete against expendable?

Answer: Competition between the Shuttle and expendable launch vehicles for simply launching spacecraft, i.e., exclusive of considerations on retrieval, repair, or in-orbit checkout, can be considered primarily a function of availability and cost to the user. Launch availability takes into account the capability of the given launch system to meet the user's requirements for a timely launch. Perceptions that a launch system is having difficulty in meeting established schedules can be a major factor, whether this is due to saturation of capability, launch priority issues, or launch system technical problems. Launch cost is a complex consideration of insurance premiums, basic launch services charges, integration costs, and financing. We believe that the Shuttle has sufficient launch capability over the next several years at least to satisfy the launch timing requirements of most customers and that the Shuttle is a safe and reliable launch system. Current Shuttle launch prices are competitive and financing arrangements are being developed with lending institutions as necessary. Although there has been comparatively little advantage taken to date of the Shuttle's unique capabilities for on-orbit operations for the communications class of customer, we anticipate that the development of appropriate upper stages and the customer's utilization of his own payload specialist will prove to be factors which enhance the Shuttle's competitive position.

Centaur Upper Stage

Question: Please provide your latest cost estimate and schedule for the development of the Centaur-G and Centaur-G-Prime, also provide an estimate of the total DOD funding that will be made available for the Centaur-G development.

Answer: The development of the Centaur-G and G-Prime is estimated to cost $380 million, including cost incurred -- prior to the initiation of the joint NASA/USAF program--for the original Centaur planetary vehicle development. The USAF share of the $256 million required for the joint development of the common Centaur-G is $128 million. NASA is responsible for the development of the Centaur-G prime vehicle (estimated at $85 million), the RL-10 engine qualification activity ($5 million), and the pre-Centaur-G/-G prime development effort ($33 million).

Private Financing of the Fifth Orbiter

Question: What other members of the Administration have reviewed this proposal?

Answer: When the initial concept proposed by the Space Transportation Company was received in February, 1982, it was reviewed by the OSTP, OMB, and Council of Economic Advisors. These reviews were not indepth reviews. The elements of the concept were revised by the Space Transportation Company in May, 1982. A review team was subsequently established by NASA to review the revised submission. This team included a representative from the DOD.

Question: What are your tentative conclusions about the requirements that would have to be met in order to support the private financing of a fifth orbiter?

Answer: NASA has held a series of discussions wiht the Space Transportation Company with an objective of exploring and gaining a better understanding of the concept proposed. The Space Transportation Company has indicated that, on the basis of these discussions and the FY 1984 budget, it is preparing a revised and more complete submission to NASA.

The information provided to NASA was not a complete proposal. The Space Transportation Company also indicated that the terms and conditions submitted and the concepts defined were to be considered negotiable. The information provided to NASA was sufficient to perform only a preliminary evaluation of certain aspects of the concept.

Since the Space Transportation Company has informed NASA that it is in the process of preparing a more complete and definitive proposal, it would be premature to discuss the specifics of NASA's views prior to a thorough evaluation of this more comprehensive submission. NASA feels that the concept proposed was consistent with the objective of expanded private sector involvement and investment in the conduct of space activities. Nevertheless, there were areas in the submittal that would, in our opinion, require modifications to meet the criteria of being in the public interest as well as meeting the legitimate interests of the Space Transportation Company.

Launch Umbilical Tower (LUT) at Kennedy Space Center, Florida

Question: I am aware that there is a lot of concern in the historic preservation community over NASA's plans to demolish the last of three launch umbilical towers at the Kennedy Space Center in Florida. What are your current plans relative to the LUT?

Answer: Our current plans for the remaining Apollo/Saturn V Launch Umbilical Tower call for exercising the preservation option and negotiating a detailed cost and engineering plan with the contractor. We are proceeding with this option with the understanding that Congress will authorize additional funding to cover the cost of the preservation option.

Centaur/IUS Costs

Question: Last year, you provided the Subcommittee with a table displaying the runout costs for launching Galileo and ISPM on both IUS and Centaur. Could you please update this for the record?

Answer: Since we submitted this chart last year, the IUS planetary program has been terminated and the Centaur/STS program initiated per Congressional direction in the FY 1982 Supplemental Appropriation.

NASA was then joined by DOD in a joint DDT&E program for Centaur. The NASA DDT&E costs in the the FY 1984 budget for one-half of the common Centaur-G development and our total cost for the G-Prime Centaur, plus two vehicles for Galileo and ISPM, integration, and orbiter and KSC modifications are continued in the attached exhibit. (Enclosure 4)

DOD Funding on Centaur G

Question: Please provide for the record a copy of the Memorandum of Understanding between NASA and the Department of Defense relative to the funding of the Centaur-G upper stage vehicle.

Answer: Attached is a copy of the Memorandum of Understanding between NASA and the Department of Defense on the Centaur-G DDT&E. (Enclosure 5)

NAS Report

Question: Could you please provide for the record your latest cost figure associated with the facilities identified in Figure 6 (Page 34) of the Academy Report for each of the facilities under the 30 launch rate scenario and under the 40 launch rate scenario?

Answer: The best available unit cost estimates for facilities and equipment listed in Figure 6 of the Academy report are as follows: (It should be noted that some of these estimates are fairly accurate for near-term facilities while others are very rough order of magnitude estimates for projected facilities.)

FACILITY	REMAINING For 30/yr (FY 1984 & Subs) ($ in millions)	REMAINING For 40/yr (FY 1984 & Subs) ($ in millions)
Orbiter Processing Facility (Cell) (2 Exist)	None	*3rd, $25-$35
Vehicle Assembly Cell in VAB (2 Exist)	None	*3rd, $90-$110
Mobile Launcher Platform (2 Exists)	3rd, $60	*4th,*5th,$90-$12 ea
Launch Pad		

(1 Exists)	2nd, $45	*3rd, TBD requires detailed study
Firing Room (incl. s/w Facil) (2 Exists)	None	*4th, $65-$80
Vertical Processing Facility (Cell) (1 Exists)	2nd, $3	*3rd, $25-$35
SRM Processing and Storage Facility (1 Exists)	2nd,$22-$28	None (2 only)
Shuttle Mission Simulator (2 Exists)	**3rd, $135	None (3 only)
Shuttle Training Aircraft (2 Exists)	3rd, $27	*4th, $30-$40
Flight Control Room (2 Exists)	**3rd, $400	None (3 only)
Shuttle Carrier Aircraft (1 Exists)	2nd,$50-$75	None (2 only)

*Additional facilities currently not considered necessary to achieve 40 per yr. Actual experience will dictate the necessity of these facilities.

**3rd Shuttle mission simulator and 3rd flight control room not required to be funded by NASA, if USAF provides CSOC (Consolidated Space Operations Center).

Question: Page 32 of the report contains a table that identifies the various constraints of Shuttle launch rates. By far, the most constraining factor is the solid rocket booster refurbishing. The report states, "the planning is not in place and procedures remain to be developed to refurbish solid rocket boosters to meet the mission model." The table indicates that even at an annual launch rate of 18 per year, the booster refurbishment capability is "marginal." Do you agree with this assessment and what is NASA doing in order to upgrade their capability in this area?

Answer: We agree with the assessment that solid rocket booster refurbishment is a constraining factor to achieve launch rate and our current capability is marginal to support a launch rate of 18 flights per year. There is, however, planning in place to upgrade this capability to support the mission model requirements. Some of the specific actions underway to achieve this are as follows:

- The production capability of our current facility is being expanded to provide a flight rate capability of 16 flights per year in FY 1984. Activities are also underway to improve production rate by means of hardware/assembly producibility improvements and to provide a new refurbishment facility with a capability of flight rates up to 24 per year with a capability for expansion to 40 flights per year. This facility will be located on or near KSC.

- Producibility improvements such as improved thermal protection system, simplification of external tank/solid rocket booster interface closeout activities, and some hardware redesigns are being implemented which will reduce the amount of time it takes to refurbish a solid rocket booster. These improvements, when combined with the new refurbishment facility, will enable us to support the mission model for the Shuttle program.

DOD/NASA Cost Sharing

Question: Please list all of the FY 1983 and FY 1984 programs in which NASA and the Department of Defense are proceeding with jointly funded technology programs and the DOD cost contribution on each.

Answer: Department of Defense funding for joint projects is shown below. The total DOD cost contributions are not readily available because DOD not only provides funding but it also supplies aircraft, engines, logistical support (spares and parts) and manpower to these programs.

NASA/DOD Jointly Funded Technology Programs
($ in millions)

	DOD Funding	
	FY 1983	FY 1984
Research and Technology Base	4.1	6.2
Propulsion Systems Research and Technology	3.3	4.1
Engine Dynamics	---	---
Small Engine Component Technology	3.2	4.0
Controls and Guidance Research and Technology	.1	.1
Computer Science and Applications Research and Technology-IPAD	.7	2.0
Systems Technology Programs	72.3	50.5
Rotorcraft Systems Technology	16.8	14.0
Convertible Engine	.4	---
X-Wing	15.7	12.7
Integrated Tech. Rotor/Flight Research Rotor	.7	1.3

High-Performance Aircraft Systems Technology	54.3	32.2
AFTI/F-16	11.4	7.5
AFTI/F-111	2.7	2.6
F-14 High Angle of Attack	---	---
X-29A Forward Swept Wing	39.9	22.2
HIMAT	---	---
F-15 Digital Electronic Engine Control	.3	---
Subsonic Aircraft Systems Tech-Comp Structures Tech.	1.2	4.2
TOTAL	76.4	56.7

Alleged Illegal Charges to the Space Shuttle Program

Question: At last year's hearing, you were questioned about the investigations that were underway regarding Rockwell International's alleged charging to the Space Shuttle certain costs attributable to other Air Force programs. At that time, investigations were not complete and you noted that the issue was currently under review by the U.S. Department of Justice.

Could you please bring us up-to-date as to what the conclusions of these investigations were and the actions that NASA has taken to assure that this does not recur in the future?

Answer: The investigation into the alleged mischarging by Rockwell International was begun after a source alleged that massive numbers of labor hours for the U. S. Air Force Global Positioning Satellite (GPS) fixed-price incentive contract with Rockwell International Space Division were being mischarged to the cost-reimbursible Space Shuttle contract. After preliminary investigation by the NASA Office of Inspector General, the allegation was referred to the FBI, Los Angeles, and a decision was made to conduct a joint investigation.

An investigative task force consisting of prosecutors from the U.S. Attorney's Office, FBI special agents, DCAA auditors and NASA investigators and auditors was organized to collect evidence, conduct interviews, and sample financial and manufacturing records at Rockwell. During the course of the investigation, 228 witnesses were interviewed. Several advised that they had some knowledge of mischarging or had actually mischarged. Audit sampling techniques indicated that substantial mischarging had taken place.

The results of the investigation were presented to the U.S. Attorney in Los Angeles. In lieu of prosecution, the Justice Department elected to file a complaint alleging civil fraud against Rockwell in the U.S. District Court, Central District of California. Rockwell agreed to enter a consent judgment against itself, without admitting or denying any of the allegations of fraud stated in the civil complaint. By the terms of the settlement, Rockwell was obligated to pay the sum of $500,000 to the United States, which sum cannot be reimbursed directly or indirectly under any Government contract. In addition, Rockwell was ordered to install a mechanized timekeeping system, the first million dollars of cost is to be absorbed by Rockwell and not charged directly or indirectly to any contract with the United States.

An injunction was entered against Rockwell by the court, permanently enjoining the company, its directors, officers, and employees from making or causing to be presented for payment any claim against the United States, knowing such claim to be false, fictitious, or fraudulent.

The Settlement Agreement also provides that all audits of time or labor charges conducted by Rockwell internal auditors shall be done without advance notification. Copies of these audit reports are to be made routinely available to Government auditors. Also, each bargaining unit employee will be individually responsible for the entry of his or her time and labor charges. No longer will supervisors be permitted to enter the time charges of their subordinates. On a daily basis, Rockwell timekeepers shall perform verification audits in which they compare the work being performed with the work activity recorded into the computerized timekeeping system.

Under the agreement, any Rockwell Space Group employee who receives or overhears any instruction to incorrectly record labor or time charges shall inform DCAA or the NASA Office of Inspector General (OIG). All Space Group employees will be informed in writing of their obligations under the consent decree. In addition, Rockwell will show a film, not less than annually, to its Space Group employees on the importance of accurately recording time charges. The cost for production of this film shall be borne by Rockwell and will not be charged directly or indirectly to any Government contract.

A violation of the court order could result in Rockwell or its employees being held in contempt of court, in imprisonment with monetary sanctions, and in appropriate disciplinary action by Rockwell, up to and including dismissal from employment. The NASA OIG has established an office on site at the Rockwell location in Downey, California. Functions of this office include monitoring the actions taken to insure that the terms of the court order and settlement agreement are complied with fully and faithfully.

If the terms of the court order are complied with in full, this should prevent future mischarging of contract costs.

Search for Extra-Terrestrial Intelligence

Question: Could you please bring us up-to-date on the cost and plans for Search for the Extra-Terrestrial Intelligence (SETI) program during FY 1984 and how this compares to the costs and activities undertaken during FY 1983?

Answer: The FY 1983 funding level for the Search for Extra-Terrestrial Intelligence (SETI) is currently planned at approximately $1.7 million. The FY 1983 funding will be utilized to complete development activities on the multi-channel spectrum analyzer; to continue development of software algorithms for this module; and to prepare the design specifications for the antenna feeds and amplifiers. The FY 1984 budget includes a level of $1.7 million for continuing SETI activities such as field tests of the multi-channel spectrum analyzer to provide verification of hardware designs, develop and test signal recognition software, and develop automated SETI search procedures. In addition, FY 1984 funds will be used to initiate a systematic expansion of the functional capability of the SETI data system module, and to initiate new SETI university research activities.

Physics and Astronomy

Question: Please provide for the record a detailed list of each of your Physics and Astronomy programs that show an increase in FY 1984 over the FY 1983 level.

Also indicate which of those programs involve international cooperative agreements.

Also note in the listing, those that involve items of particular interest to industry.

Answer: The following lists those Physics and Astronomy programs that show an increase in FY 1984 over the FY 1983 level:

Senator Garn—Continued

Gamma Ray Observatory (GRO) Development The FY 1984 requested funds will support the planned build up of development efforts as major detailed design effort nears completion and hardware fabrication gets underway on both the spacecraft and the scientific instruments, leading to a launch in 1988. The GRO development effort includes international participation for development of two of the four experiments: the Imaging Compton Telescope (COMPTEL) and the High Energy Gamma Ray Instrument (EGRET).

Spacelab Payload Development and Mission Management: FY 1984 funding for Spacelab Payload Development and Mission Management supports a buildup of payload development and mission management/integration activities leading to the launches of Spacelab 1, 2, and 3 as well as OSTA 2 and 3, Materials Processing payloads, the Large Format Camera, etc.

Foreign participation is an ongoing, integral part of the current Spacelab payload development program. In addition to Spacelab hardware, ESA, as well as other individual nations are providing half the payload for Spacelab 1 and will be heavily involved in analysis of data from this mission in FY 1984. On Spacelab 2, a number of instruments are being provided by the United Kingdom. This pattern also is continuing for subsequent planned missions, such as Spacelab 3 and 4. In addition, the Solar Optical Telescope program will include co-investigators from the Federal Republic of Germany.

Explorer Development: The major increase in the Explorer Development FY 1984 funding level will be used primarily to initiate design and development activities on the Extreme Ultraviolet Explorer leading to a launch in the 1988 timeframe.

The Active Magnetospheric Particle Tracer Explorer (AMPTE), as part of the Explorer development activities is a cooperative effort with the Federal Republic of Germany, which is developing one of the two spacecrafts to be flown on this mission.

In addition, the Explorer program is of continuing interest to industry, which traditionally has been relied on for developing many of the spacecraft and instruments for past and present missions.

Mission Operations and Data Analysis: The FY 1984 increase in funding level over FY 1983 is in primary areas:

Space Telescope Operations/Space Telescope Maintenance and Refurbishment. The FY 1984 increase in funding is a result of the natural activity buildup in preparation for the launch of the Space Telescope and its subsequent maintenance. Some examples of these efforts include the development of mission operation procedures, the science operations ground system, funding for the Space Telescope Science Institute, planning and long-lead procurements for maintenance of the Space Telescope, etc.

ESA is providing support to the Space Telescope Science Institute.

High Energy Astrophysics Observatories (HEAO) Extended Mission Operations: The FY 1984 increase allows for a moderate and more orderly or timely reduction and analysis of the data obtained from the HEAO missions.

Research and Analysis. The increase in FY 1984 funding over the FY 1983 level basically reflects a minor increase for inflation.

Suborbital Programs. The FY 1984 increase reflects inflation over the FY 1983 appropriated amounts, plus an additional increase in the Balloon program for the operation of the National Scientific Balloon Facility. This activity had previously been supported through the National Science Foundation.

The suborbital programs have historically provided a source of continuing international cooperative activity as foreign experiments are flown on suborbital platforms or as balloon or sounding rocket campaigns are conducted in other countries such as Canada, Norway, Peru, Australia, etc. Cooperative efforts are expected to continue during FY 1984.

Suborbital Observations

Question: Please provide for the record a list of the specific activities that are expected to be undertaken in FY 1983 and those that are expected to be undertaken in FY 1984 in your Suborbital Observatory program.

Answer: The FY 1983 sounding rocket, airborne science and applications, and balloon planned activities are as follows:

Sounding Rockets: Launch approximately 69 sounding rockets in support of the scientific disciplines of galactic astronomy, high energy astrophysics, solar physics, upper atmosphere, plasma physics, interdisciplinary science and materials research. A major campaign was launched from Peru in March, 1983, in support of plasma physics. This campaign included the launch of 18 rockets, of which 17 were totally successful.

Airborne Science and Applications: Launch approximately 72 flights of the C-141 Kuiper Airborne Observatory to continue exploration in the star forming regions.

Balloons: Launch approximately 62 high altitude research balloons in support of the scientific disciplines of galactic astronomy, high energy astrophysics, solar physics, upper atmosphere, and plasma physics. Major periods of activity for ballooning are in the late April/May timeframe and early September/October timeframe. In FY 1983, extensive campaigns in support of upper atmospheric research are planned for these periods.

The FY 1984 sounding rockets, airborne science and applications, and balloon planned activities are as follows:

Current plans assume the launch of approximately 64 sounding rockets and 62 high altitude balloons in support of basic science and instrument development in the traditional disciplines under astrophysics and environmental observation programs. A balloon campaign is scheduled for Australia which will combine studies in the disciplines of high energy astrophysics and solar physics. In the airborne science and applications program, efforts will be concentrated in the area of astronomy research by using the C-141 Kuiper Airborne Observatory and approximately 480 additional flight hours in support of studies of the far infrared spectral responses from galaxies and other terrestrial bodies.

Question: Please indicate which activities will be conducted through balloons, which on sounding rockets, and which on high flying aircraft.

Answer: The activities which are being or are planned to be conducted in FY 1983 and FY 1984, respectively, through the use of balloons are:

Disciplines	Number of flights FY 1983	FY 1984
Galactic Astronomy	8	6-8
High Energy Astrophysics	14	12-15
Upper Atmosphere	35	30-40
Plasma Physics	5	2-5

The activities to be conducted through the use of sounding rockets are:

Disciplines	Number of flights FY 1983	FY 1984
Galactic Astronomy	8	11
High Energy Astrophysics	4	7
Upper Atmosphere	7	9
Plasma Physics	39	27
Solar Physics	4	4
Interdisciplinary	6	6
Materials Processing	1	1

In support of Infrared Astronomy, the aircraft observations through the use of the C-141 Kuiper Airborne Observatory will be conducted from Australia and will concentrate on observation of deep Southern Hemisphere objects. These activities will be carried out by seven teams of U.S. astronomers and two Australian teams. In addition, seventeen research flights will be conducted with aircraft.

Gamma Ray Observatory Development

Question: In describing your activities under your Gamma Ray Observatory development program, you note that spacecraft and scientific instruments hardware fabrication will be initiated in FY 1984.

How much of the $89.8 million requested for the Gamma Ray Observatory is related to spacecraft and scientific instruments hardware fabrication?

What specific instruments do you intend to begin fabrication on and what is the expected cost of these instruments and the required delivery schedule?

Answer: The Gamma Ray Observatory (GRO) request for FY 1984 is $89.8 million. Approximately $71 million of the request is related to spacecraft hardware, and approximately $19 million is related to scientific instruments hardware.

All four of the GRO experiments will be in fabrication in FY 1984. The four experiments are: (a) Oriented Scintillation Spectrometer Experiment (OSSE),

(b) Burst and Transient Source Experiment (BATSE), (c) High Energy Gamma Ray Telescope (EGRET), and (d) Imaging Compton Telescope (COMPTEL). The COMPTEL experiment is being developed by the Federal Republic of Germany. The estimated cost of these instruments is in the $60 to $70 million range. Delivery of the scientific instruments to the spacecraft contractor, TRW, is scheduled for early 1987.

Spacelab Payload Development Mission Management

Question: This year you are requesting $92.9 million for your payload development mission management program. One of the activities to be undertaken within that program is the definition and early design of the Solar Optical Telescope (SOT) Facility.

How much money had you planned to make available for the Solar Optical Telescope in FY 1984?

Who was the prime contractor selected for the development of the Solar Optical Telescope in January?

On what basis was Perkin-Elmer selected, given their performance on the Space Telescope program?

What is your current plan for funding this program in the event that you do not receive additional funds that are sufficient to cover the overrun expected on the Space Telescope during FY 1984?

Answer: The FY 1984 budget request assumed a level of approximately $16.0 million for the Solar Optical Telescope design and development activities.

Perkin-Elmer Corporation of Danbury, Connecticut, was awarded the contract for the Solar Optical Telescope Facility in January 1983.

Perkin-Elmer's proposal was selected in accordance with Agency Source Evaluation Board procedures.

NASA is still reviewing potential funding sources for additional funds needed for Space Telescope development efforts in FY 1984. However, delaying the Solar Optical Telescope launch is one means which NASA is considering for obtaining part of the additional FY 1984 funds required for Space Telescope.

Explorer Development

Question: In describing your Explorer Development program, you note that in FY 1984 money will be provided for definition studies of potential future explorer missions such as the X-ray timing explorer.

How much money have you included in your FY 1984 budget for such definition studies in your Explorer Development program?

Answer: The Explorer Development program in FY 1984 includes approximately $4.0 million for future Explorer definition studies.

Space Telescope Development

Question: In describing your activities for the Space Telescope during FY 1984, you list $51.5 million for Mission Operations and Data Analysis and $14.2 million for Space Transportation Systems Operations.

How did you arrive at the funding levels for these items--was it based on an 1985 launch date for the telescope?

To what extent could you defer these activities until FY 1985?

Along the same lines, you are currently carrying an estimate of $43.9 million for Mission Operations and Data Analysis and $7.5 million for Space Transportation Systems Operations in your FY 1983 Operating Plan. Based on the recent developments with the Space Telescope, to what extent could these be deferred or stretched out?

Answer: The FY 1984 budget assumed a level of $51.5 million for Space Telescope operations and maintenance and refurbishment, plus $14.2 million for Space Transportation System Operations. These estimates are based on a first half 1985 launch of the Space Telescope.

Since submission of the FY 1984 NASA budget, Space Telescope has undergone extensive review. Due to technical and managerial problems experienced during development of the Space Telescope, the planned launch date will be slipped by at least one year; therefore, the Mission Operations and Data Analysis (Space Telescope operations and Space Telescope maintenance and refurbishment) will be deferred consistent with the revised Space Telescope launch schedule.

We are also reviewing the requirements for the previously planned number of Shuttle flights in FY 1985 as a result of the Space Telescope slip and may reduce the 13 planned flights to 12 flights accordingly. The rephasing of hardware delivery schedules and payload support funding would result in some decrease in the FY 1984 requirements.

Space Telescope Ground Systems

Question: How much money do you have in your FY 1984 budget for the Space Telescope Data Capture Facility and the Space Telescope Science Institute?

Answer: The Space Telescope Data Capture Facility, funded by the Office of Space Tracking and Data Systems, is budgeted at about the $3 million level in FY 1984.

The Space Telescope Science Institute, funded by the Office of Space Science and Applications, is budgeted at about the $9 million level in FY 1984.

Space Telescope Maintenance and Refurbishment

Question: In FY 1984, you are requesting $13.5 million for the maintenance and refurbishment of the Space Telescope.

I understand the need to provide advanced development money for the science operations ground system associated with the Space Telescope before the expected launch date, however, given the possible delay in launching the telescope, could the funding be stretched out as to reduce the requirements for maintenance and refurbishment during FY 1984?

Answer: All elements of the Space Telescope program are currently being reviewed as a result of the current Space Telescope development difficulties and a launch slip of at least one year may be required. Because of the delay in the launch date of the Space Telescope, the maintenance and refurbishment activities will most likely be slipped out consistent with a revised launch date; thus, the early year funding requirements could be reduced.

Question: Please provide for the record a breakout of the specific activities that you plan to fund during FY 1984.

Answer: The specific maintenance and refurbishment activities planned for FY 1984 are currently under review as part of the overall Space Telescope review. Therefore, the specific FY 1984 requirements will not be known until the extent of the launch schedule slip has been determined.

Gravity Probe-B

In describing your research and analysis program in Physics and Astronomy, you note that FY 1984 funding will support continued feasibility and scientific definition studies on future candidate missions such as the Gravity Probe-B.

Could you please describe the activities that you intend to undertake during FY 1984 relative to the Gravity Probe-B experiment, and the expected level of effort?

Could you please provide a description of the program including a suggested schedule and an estimate of the total program costs?

Answer: The FY 1984 planned activities for Gravity Probe-B (GP-B) include the completion of the design of a multi-gyro test instrument which is required to integrate the individually demonstrated component technologies into a functioning system. Fabrication of this test instrument will also be initiated. In addition, the definition of the interface between the instrument and the cyrogenic dewar will be completed as will a model of the instrument quartz block assembly. The current planned level of funding for Gravity Probe-B in FY 1984 is approximately $2.0 million.

The objective of the Gravity Probe-B mission is to measure the relativistic precession of an extremely stable, cryogenic gyroscope in earth orbit. Two effects will be measured, the geodetic effect and the motional or frame dragging effect. These measurements are required to confirm Einstein's General Theory of Relativity which is one of the most far reaching, but least tested theories of physics. The Gravity Probe-B instrumentation will consist of a star tracking telescope which will provide an inertial reference against which the precession of the spin axis of four gyro rotors will be measured. The orientation of the gyroscope's spin axis will be continuously measured and compared with the telescope during the mission life.

However, because of the technical complexity of the Gravity Probe-B mission, a full-scale development can not be undertaken for a few more years. A very rough "ball-park" estimate of the cost of a GP-B mission is on the order of $300 to $500 million.

Shuttle Payloads for Future Space station

Question: In FY 1984, you are requesting $2 million to define potential payloads for a future space station under your Spacelab payload development mission management program. What types of activities will be undertaken during the FY 1984?

Why are you funding this space station work under your Spacelab payload development mission management program?

Answer: In FY 1984, studies will be conducted to define potential new payloads compatible with a space station; and definition of potential economical future use of the space station.

The payload definition required at this time is uniquely suited to the ongoing Spacelab activity, first from the view that existing and planned Spacelab instruments can be adapted for use on a space station so that longer flight periods can be obtained, and a standard engineering interface, comparable to that of Spacelab, can be defined. In addition, the "lessons learned" in development and integration of the instruments on the Spacelab are expected to be of great value in future space station payload definition.

Sounding Rockets Program

Question: In describing your suborbital programs in Physics and Astronomy, you make reference to a sounding rocket payload concept called "Spartan." Could you please describe this concept in more detail for the record?

Answer: The Spartan concept is basically the flight of sounding rocket-type payloads on the Space Shuttle. It consists of a mini-satellite designed to utilize sounding rocket technology with short duration, free flying payloads. Each Spartan is designed to function as an autonomous free flyer, incorporating pointing, data recording and a self-contained target sequence. Mission life will be approximately 40 hours.

Scientific instruments are being chosen from the existing pool of sounding rocket payloads already on hand; payload maturity with a proven record of success and productivity are tantamount to the selection. The present plan for Spartan calls for the development of three "carriers" for the scientific disciplines of high Energy Astrophysics, Solar Physics and Optical Astronomy.

The first of the Spartan carriers is being designed to accommodate an X-ray detector and is scheduled to be flown on STS-17.

The second and third Spartan carriers are being designed to support the disciplines of Solar Physics and Optical Astronomy, respectively, and will incorporate stellar pointing rather than solar pointing.

Question: Your budget anticipates the planned initial launch of Spartan payload in FY 1984.

Could you please describe the specific type of payload envisioned for this launch?

How much money have you designated in your FY 1984 budget for the development of this payload and the cost of launch services?

Answer: The first of the Spartan payloads is an X-ray detector development by Dr. Ray Cruddace of the Naval Research Laboratory. It is scheduled to be flown on STS-17 in 1984.

In FY 1984, we have requested approximately $2 million for the development of the three Spartan carriers.

Operational Medicine in Space Biology

Question: The goals of your operational medicine in biological research programs are to assure the health of our astronauts and payload specialists and to assure their ability to function effectively in the space environment. The experience gained from these medical studies will provide the necessary information to allow a broader segment of the population to participate in all aspects of future space missions and extend the time that can be spent in space without detrimental effects.

To date, about half of our Space Shuttle astronauts have experienced some form of "space sickness." This is a larger portion than experienced in previous manned flight missions.

How do you account for this phenomena?

What specific activities are you undertaking in order to counteract these space effects?

Would you expect that the frequency and severity of bay sickness would increase in the space station or space platform environment or have we sufficiently defined the problem to develop countermeasures?

Answer: NASA believes that the increase in space motion sickness for the Space Shuttle astronauts, as compared to the lower incidence of motion sickness on previous manned missions is due to the increased mobility of the crew members. In previous missions, except for Skylab, the crew remained relatively immobile in their seats for much of the mission. Therefore, we believe that there is some correlation between the conflicting inputs from, and between, the vestibular organs, and the eyes; thus, the increased mobility within the Space Shuttle allows more opportunities for this conflict to occur.

NASA is continuing to study the cause of space motion sickness, and some of the activities which are currently being used to counteract or prevent these effects on astronauts are as follows:

- Use of anti-motion sickness medication before or early in the flight;

- Reminding crewmembers to move cautiously during the first few days of flight;

- Conducting intensive vestibular training on a rotating chair;

- Having the astronauts perform aerobatics in training aircraft before each flight;

- Performing parabolic flight maneuvers so that the astronauts will have a chance to get used to the zero-g effect; etc.

In addition, an intensive research program is being conducted at the Johnson Space Center in an attempt to predict who will be effected by space motion sickness to determine prevention methods.

We do not expect the frequency or severity of space motion sickness in a space station to significantly vary from that of the Space Shuttle, as long as the same vestibular training is conducted, particularly since the problem subsides after a few days of space flight. NASA is, however, continuing to study the space motion sickness problem on future Shuttle missions to be able to reduce the current incidence either through preflight adaption procedures or use of medications.

Question: Please provide for the record the specific studies and dollar amounts associated with your operational medicine and biological research programs during the FY 1984.

Answer: This Life Sciences operational medicine activity is sponsoring research primarily in space adaptation syndrome (space motion sickness) causes, prevention and cures, cardio-vascular deconditioning, dysbarism, toxicology, and development of medical hardware and procedures for use in zero-g. The FY 1984 funding level is currently planned at approximately $8 million.

The Life Sciences biomedical research activity is primarily sponsoring vestibular physiology, bone alterations, muscle atrophy, fluid and electrolyte changes, and biological effects of radiation. The FY 1984 funding level is currently planned at approximately $8 million, also.

Galileo Mission

Question: The Galileo mission is expected to be launched in 1986 in the Space Shuttle and be propelled to Jupiter on the Centaur upper stage. Your budget justification states that "during 20 months of operation the Jovian System Galileo will have the capability of providing six satellite encounters." When the Committee was briefed on the merits of using a Centaur upper stage rather than the IUS for the Galileo mission, NASA provided materials showing that the Galileo would have the capability of providing eleven satellite encounters versus this six that could be expected with the use of the IUS.

What is the basis for this apparent change in the estimate of the number of encounters?

Answer: With the Centaur upper stage, Galileo will have the capability for eleven encounters with the major satellites of Jupiter during its 20 months of operation in the Jovian system. The statement in the FY 1984 budget justification which referenced six encounters was incorrect; the six satellite encounters was consistent with a Shuttle/IUS launch.

Venus Radar Mapper Mission

Question: For FY 1984, you are requesting $29 million for your Venus Radar Mapper mission. Before this new start, the mission was known as the Venus Orbiting Imaging Radar.

What is the estimated cost of the mission as newly configured compared to the originally based line mission?

Does this cost include an estimate for space transportation support?

Answer: The estimated runout cost of the Venus Radar Mapper mission is in the $350 million range. This compares to an estimated cost of $660 to $740 million for the Venus Orbiting Imaging Radar mission which was proposed as a new initiative in FY 1982.

Neither of these estimates include the space transportation system launch costs.

Multispectral Linear Array

Question: One of the goals listed under your Space Science and Applications program is "remote sensing to acquire information which will assist in the solution of earth resources and environmental problems."

In this respect, your FY 1983 request contained $11 million for the development work on the Multispectral Linear Array, a next generation sensor for the Landsat program. For FY 1984, you are requesting $9.3 million.

What was your request to OMB for this program in FY 1984.

What benefits would be derived from the availability of a Multispectral Linear Array?

Is this the next logical development step for the Landsat family of satellites?

Given your current plan, when would you expect to have a flight test article available and when might this be flown?

What additional activities did you plan to undertake in your OMB submission and what affect would these additional funds have on your schedule?

Answer: The FY 1984 OMB budget request for the Multispectral Linear Array program was $9.6 million.

The availability of a Multispectral Linear Array (MLA) sensor would significantly improve the remote sensing capabilities across a wide spectrum of research and application areas. A significant improvement in the ability to monitor the earth's surface and an order of magnitude improvement in the ability to discriminate and classify land cover types is anticipated with a spaceborne MLA sensor. In addition with its high spectral resolution capability, a MLA sensor has the potential for the direct identification of important geological minerals and botanical classes from space.

Scanning sensors, such as the Thematic Mapper, are at their limit of performance. Even as the Thematic

Mapper was under development, it was determined that a system with higher spatial resolution and radiometric would be required. This determination led to the MLA instrument concept. The French SPOT system is representative of this new generation of sensors.

The current plan for the MLA activities assumes the development of advanced technology required for a Shuttle/Spacelab instrument. Such an instrument could be ready for flight in the late 1980's; however, we do not currently have plans for actual instrument development. A decision has not been made as to when and if NASA would build the actual MLA instruments.

The content of the FY 1984 MLA program is basically the same as was proposed to OMB. The only change made by OMB to the MLA program was a minor decrease in the inflation assumed.

Canadian Arctic Mapping

Question: Last year I questioned you about the Canadian Government's recently proposed program to map the arctic ice fields on a continuing basis. At that hearing, I noticed that the Canadian Government proposed a joint satellite program but the United States decided not to participate. In response to my questions, you noted that NASA is currently "examining possible participation in this mission," but a decision has not yet been made.

What is the current status of your examination of this mission and your conclusions about American participation?

Answer: The situation has not changed significantly over the past year. The potential for collaboration continues to exist. However, a significant U.S. commitment on the matter of a RADARSAT will not be timely until FY 1986. This is consistent with current Canadian planning for initiation of the actual satellite development which will not occur until 1986. The general framework for cooperation that is being examined involves U.S. contribution of (1) flight instruments to complement the Synthetic Aperture Radar sensor which is the prime instrument for the RADARSAT mission, (2) a western test range launch aboard the Space Shuttle, and (3) direct readout of the satellite at U.S. ground stations. Canada would provide the primary sensor, the satellite (through a cooperative arrangement with the United Kingdom), integration of all sensors with the satellite, prelaunch testing, operation of the satellite and the primary ground station, and the primary data analysis facility for the radar data. The data and scientific findings would be shared by all three countries involved.

Halley's Comet Cost

Question: Last year, I questioned you about the cost involved in providing the tracking and data acquisition activities for the missions to Halley's Comet by the European Space Agency (ESA) and the Japanese. At that hearing, you noted that negotiations are in progress with the ESA on the extent of the Deep Space Network (DSN) support and the schedule of the DSN activities. You further noted that the total anticipated cost of the ESA from FY 1982 through FY 1986 is expected to be approximately $2.5 million.

What is the current status of this negotiation and your most current estimate of the cost?

Answer: With respect to the current status of the negotiations, details of the agreement with the ESA have been completed and the document is in the process of being signed. We are at the present time working out appropriate arrangements with the Japanese. Plans are underway for the Deep Space Network to support both the ESA and Japanese missions on a reimbursable basis.

We now anticipate reimbursement from ESA in the amount of approximately $2 million, since we have now arranged for use of ESA equipment installed on the Australian Parkes antenna to support our Voyager 2 Uranus encounter.

Solar Maximum Mission

Question: What data is currently being provided by Solar Maximum Mission (SMM) and how long would you expect this data to continue to be available?

Answer: Three of the seven experiments on the SMM are now returning data. These are the nonimaging instruments which view the whole sun. The Gamma Ray Experiment is providing 24-hour coverage of gamma ray and neutron emission from strong solar flares. The Hard X-Ray Burst Spectrometer, the most sensitive flare sensor on SMM, is returning 24-hour coverage of energetic X-rays from solar flares. The Active Cavity Radiometer is monitoring the variations in the brightness of the entire sun's disk.

This data return is expected to continue for several more years. However, with the Solar Maximum Repair Mission, four more instruments will become operational through repairs. The SMM data return will be

continued

for at least two years after the repair mission; at which time a decision will be made as to whether the data value justifies continuation of the mission.

Acid Rain

Question: For FY 1983, you are requesting $128.9 million. To what extent will your Environmental Observations program be of value in detecting the circulation and fate of nitrous oxide and sulfur oxide clouds associated with acid rain?

Answer: NASA is a statutory member of the Interagency National Task Force on Acid Precipitation. The Director of the Earth Science and Applications Division within the Office of Space Science and Applications is the NASA representative on this task force. NASA personnel also serve on two working groups of the Task Force, one on Atmospheric Processes and one on Natural Sources and Sinks. NASA does not fund any work directly aimed at the acid rain problem, but approximately $1.3 million of "acid rain related" work is conducted within the Environmental Observations activities. This work, although initiated for reasons other than acid rain, should contribute to the understanding of long-range transport of sulfur and nitrogen compounds, their interactions in the atmosphere, and their natural sources and sinks.

Landsat-D Prime

Question: Your budget justification indicated that the completion of the Landsat-D prime is scheduled for 1983 and that the National Oceanic and Atmospheric Administration (NOAA) will store the spacecraft until it is required for launch.

On the basis of the current Landsat-4, are you going to make any modifications on -D prime?

When the TDRSS is successfully deployed, will this resolve the data transmission problems on Landsat-4?

Answer: Landsat project engineers are currently developing plans to modify the X-Band transmitter and the solar array power cable on Landsat-D prime in light of the problems that have been encountered on Landsat-4.

Data transmission from Landsat-4 is restricted by the availability of the TDRSS and by the power supply problems that have recently developed on the Landsat-4 spacecraft. Intermittent loss of power from two of the four solar array panels has recurred during the past month. These reductions in power have been attributed to a faulty connection between the solar array panel and the power cable that extends from the array. Data transmission from Landsat-4 may be partially restricted after the TDRSS is successfully deployed, if the existing power supply problems grow worse. The permanent loss of a single solar array panel would not have a catastrophic impact on data collection activities. However, the permanent loss of two panels would severely restrict the data that can be collected with Landsat-4.

Landsat-D

Question: Your budget justification states that NASA will support NOAA in its new responsibility for managing the operation of the Landsat-D system.

What specific activities will NASA undertake in FY 1984 in order to provide this support and what will the costs be to NASA?

Answer: NASA is directly responsible for operation of the Landsat Thematic Mapper data processing ground systems and completion of engineering characterization of the Thematic Mapper data during FY 1984. The Thematic Mapper imagery produced by NASA is distributed to the general public by NOAA through the EROS Data Center in Sioux Falls, South Dakota. A total of $15.8 million is currently budgeted in FY 1984 for these activities.

Geodynamics

Question: The principle activity under your Geodynamics program is the crustal dynamics project. This project supports the development of laser ranging and long range baseline systems for the measurement of plate motion, plate stability and the earth's rotation. The data is expected to contribute to the understanding of why and how earthquakes occur and could potentially be used for the development of earthquake prediction methods.

Could you please supply for the record a table displaying the specific program activities expected to be undertaken by each participating agency in FY 1983 and also the specific program activities in FY 1984?

Also include in the table the level of funding associated with each of these activities in FY 1983 and FY 1984.

Answer: The information requested is given in the attached table (enclosure 5) for the five agencies participating in studies of crustal dynamics and earthquake-related research.

The NASA program is directed toward understanding the dynamics of the solid earth. It provides data and research studies of crustal movements and deformation. This data is being used as part of the basic research program on earthquake occurrence by the U.S. Geological Survey (USGS) and the National Science Foundation (NSF) under the Earthquake Hazard Reduction Act of 1977. The National Geodetic Service (NGS) of the National Oceanic and Atmospheric Administration (NOAA) is principally concerned with operational services for the monitoring of polar motion and crustal motion. The Defense Mapping Agency (DMA) of the Department of Defense, through its development of Global Positioning System (GPS) technology, is contributing to the evolution of new capabilities for geodetic measurement of local-scale crustal deformation.

Oceanic Processes Research and Analysis

Question: In FY 1984, you are requesting $18.2 million for your Oceanic Processes and Analysis program. One of the activities you are undertaking in this program is the definition and refinement of in-place sensors to reveal the three-dimensional structure of the ocean.

How much does NASA intend to devote to this activity in FY 1984?

I understand that the space base systems are essentially limited to sensing the sea surface, however. Why do you believe that NASA should be responsible for developing sea based sensors rather than having them developed by NOAA?

Answer: The FY 1984 budget assumes a level of approximately $3 million for the definition, development, and refinement of in situ sensors in oceanography. Such sensors include drifting buoys, moored and bottom-mounted systems, shipborne equipment, and island stations. With the exception of certain of the shipborne equipment, all of these sensors are designed to relay their data ashore in near-real time via the data collection and location systems aboard the NOAA and GOES spacecraft. Not only are data from these sensors needed to provide the requisite subsurface data to complement the space-derived data, but they are essential in the evaluation of the performance of the spaceborne sensors. NASA is jointly pursuing these activities with a number of agencies; for example, the drifting buoy development is being conducted in cooperation with NOAA and the Office of Naval Research (ONR). NASA needs to take the initiative with these activities, particularly when they are technically complex and expensive; otherwise, we feel that they must be available when the next NASA sensors are in space. We view these sensors, with their spaceborne data links, as an integral part of any future satellite ocean observing system.

Origin of Plasma in the Earth's Neighborhood

Question: During FY 1984, you intend to continue definitional studies for the Origin of Plasma in the Earth's Neighborhood (OPEN) study.

Could you please describe the purpose of the OPEN experiment and the types of data that will be collected?

How much money has NASA programmed for the use in the OPEN experiment during FY 1984?

What is your schedule for this program and your outyear projections for cost?

Answer: The objective of the potential Origin Plasma in the Earth's Neighborhood (OPEN) is to obtain the first quantitative assessment of the global flow of energy through the Earth's space environment above the upper atmosphere. This objective will be accomplished with a network of four spacecraft orbiting strategically in four key locations around the Earth. The space laboratories will provide simultaneous measurements of the charged particle radiation and magnetic and electrical forces that transfer, store and dissipate energy throughout the earth's dynamic space environment.

NASA's current plans assume a funding level of approximately $1.5 to $2.0 million for OPEN definition studies in FY 1984.

NASA is currently investigating the feasibility of an international/DOD cooperative OPEN mission which would assume cost sharing. It is believed that this effort will require about one year to formalize. A rough "ball park" estimate of the cost for the OPEN mission is in the $500 to $700 million range, assuming, at the earliest, a FY 1986 initiation of design and development activities.

Upper Atmosphere Research Satellite Experiments

Question: Your FY 1984 budget contains $20 million for the Upper Atmospheric Research Satellite Experiments (UARSE) and mission definition. What specific activities do you plan to undertake during FY 1984. What is the status of the nine experiments that have been selected for the UARSE.

Answer: The FY 1984 funding for the UARSE will be used for the following:

- Conduct detailed mission implementation studies;

- Continuation of detailed design of the instruments, instrument module and observatory detailed design definition efforts;

- Define the concept and design requirements for the ground data handling facility; and

- Preparation for the actual mission execution contracting activity (prepare specifications, request for proposal, implementation plans, etc.).

The instrument advanced definition activities have been completed. Detailed interface definition documents have been prepared for the instrument complement. Interface design activities to integrate the instruments into the observatory are being pursued in the areas of wiring interface specification, connector identification, power and voltage and interface definition. These interfaces will be refined as the design progresses.

Requests for proposal for the execution phase contracts for the nine instruments have been issued and comments have been received from each of the investigators. Activities are now underway to finalize and officially enter into the execution phase contracts for each of these instruments.

Question: Your budget justification indicates that "further analysis is required to determine if the mission can be conducted at a cost lower than is currently estimated." Do you have a specific target figure that you are working towards, if not, what potential savings have you identified to date?

Answer: We are not working toward determining a specific cost target for the Upper Atmosphere Research Satellite project. We have identified savings to the program of approximately $35 to $40 million by using spare multimission modular spacecraft modules from the

Landsat program. However, we have not been able to define any additional cost savings as of this time.

Cost Reductions in the Planetary Program

Question: Last year at our hearing, you indicated that NASA's Planetary program needed to be directed towards more cost-effective space exploration missions. Do you believe that modifying the Venus Orbiting Imaging Radar mission to the Venus Radar Mapper represents such a redirection?

Answer: The Venus Radar Mapper (VRM) mission is a less expensive mission than was projected for the Venus Orbiting Imaging Radar mission. Some of VRM's cost saving was due to getting spare hardware from other missions such as the Voyager and Galileo missions. Therefore, VRM does not fit exactly into the more "cost-effective" mode envisioned for the future even though the VRM mission is listed as one the initial core missions in the report "Planetary Exploration Through Year 2000" recently issued by the Solar System Exploration Committee (SSEC) of the NASA Advisory Council. The SSEC has recommended that planetary missions of the future have limited objectives; use common spacecraft; utilize a common ground operations team; etc., as potential methods of reducing the cost of future missions.

Advanced Communications Technology Satellite

Question: Currently, there are 17 U.S. commercial communication satellites located above the equator in view of the United States. Applications are on file for 24 more to be launched by the mid-1980's. These satellites will exhaust the capacity of the geostationary arc at the lower frequency bands currently in use. Capacity increases beyond the mid-1980's will require systems using new technology advances that function most efficiently in higher frequency bands. Your Advanced Communications Technology Satellite (ACTS) is one such system.

Last year, the Congress provided an additional $20 million to be used in conjunction with the ACTS. In FY 1984, you are requesting $5 million for this program. You note that the funds in FY 1984 will be used for the initiation of design and development activities. You further note that the current planning estimate for Government costs is approximately $350 million, and state "this estimate assumes that industry will make a significant cost contribution towards the development of the ACTS with a resultant sharing of the total program costs".

What type of cost sharing arrangement do you have in mind?

Given a $350 million commitment on the part of the Federal Government, what type of design, development and demonstration activities could be undertaken?

What is your current estimate as to the scheduling of this program, in terms of the major milestones?

Answer: While we cannot be absolutely certain until proposals are received, there are basically two types of cost sharing arrangements that are expected for the Advanced Communications Technology Satellite (ACTS). The first deals with the development of the ACTS system itself. We would expect the system supplier to make maximum use of his ongoing commercial development efforts to reduce the charge to the Government for such things as the spacecraft bus, ground test and control facilities, operations during the experiment period and the overall fees charged to the development effort. Also, additional payloads carried on the spacecraft bus might share in the cost of the overall system, thus potentially reducing the cost to the Government for its share of the payload.

The second and a very important area of cost sharing could happen during the experiment phase of the program, where industry would build and install, at their expense, ground terminals required to conduct experiments essential to program success. This portion of the program primarily involves the communications carriers. However, we expect ground terminal manufacturers to join with the carriers in financing this effort.

The ACTS system will be comprised of a flight spacecraft consisting of the communications payload and spacecraft bus, a master control station for mission and experiment operations, a single ground station located with the master control station, any other ground equipment required to operate the system, and the upper stage required to place the spacecraft in geosynchronous orbit. The communications payload will include a multibeam antenna, baseband processor, matrix switch, traveling wave tube, and low noise receiver technologies. The contract may also include operations and maintenance. Two years of operations are currently planned.

The ACTS system will be procured from a prime contractor who will be responsible for managing the total effort including subcontractors. A single spacecraft will be flown.

The demonstration or experiment activities conducted by NASA will include the coordination of experiments from the master control station. Experimenters will include NASA, other Government agencies, U.S. industry and universities. Non-NASA experimenters will be responsible for funding their experiments, including the installation of their own ground terminals.

The following is a listing of the currently planned major milestones for the Advanced Communications Technology Satellite project:

Request for Proposals released	March 1983
Proposals to be received	June 1983
Contract award	December 1983
System Design Review	June 1984
Preliminary Design Review	December 1984
Critical Design Review	June 1985
Initiate spacecraft integration	November 1986
Ship spacecraft to KSC	February 1988
Launch	May 1988
End experiment operations	May 1990

Cryogenic Fluid Management In-Space Facility

Question: In describing your Space, Research and Technology Program for FY 1984, you indicate that one of the activities that you will be focusing on is a Cryogenic Fluid Management In-Space Facility.

Could you please describe the type of facility you envision, the need for such a facility for future phase activities, the specific activities you intend to undertake during FY 1984, and the costs involved?

Answer: The Cryogenic Fluid Management In-Space Facility is a reusable research facility that will be carried as an attached payload on the Space Shuttle. The first flight of the research facility is now planned for FY 1987. The program objective is to study the storage and transfer of cryogenic fluids in a low gravity space environment. This technology is essential for the spacebasing of orbit transfer vehicles and for the utilization of cryogenic fluids on a space station.

The FY 1984 activity will include the completion of definition and design activities for the flight facility and experiments at a cost of $900,000. In addition, $800,000 is planned for ground based research tasks in support of the overall cryogenic fluid management program.

Aeronautical Research and Technology Reimbursable Program

Question: Page SUM-14 of your budget justification indicates that NASA expects to receive $22,850,000 in reimbursements associated with your Aeronautical Research and Technology program during FY 1983.

How much of this amount is associated with the Department of Defense?

What percent of your total Aeronautical Research and Technology program does the DOD contribution account for in FY 1983?

Answer: Approximately $18,400,000 of the $22,850,000 of reimbursements expected to be received in FY 1983 will be funded by the Department of Defense (DOD).

The estimated DOD-sponsored activities will amount to approximately six percent of the direct aeronautics R&D funding in FY 1983.

Question: Your FY 1984 estimates indicate a reimbursement of $24,290,000.

How much of this is associated with DOD reimbursements?

What percent of your FY 1984 Aeronautical Research and Technology program does this anticipated DOD reimbursement account for during FY 1984?

Answer: Approximately $20,700,000 of the estimated $24,290,000 of reimbursements expected to be received in FY 1984 will be funded by the Department of Defense (DOD).

The estimated DOD-sponsored activities will amount to approximately seven percent of the direct aeronautics R&D funding in FY 1984.

Robotics and Automation

Question: Please provide for the record a listing of each of the activities in your FY 1984 request targeted at developing robotics and/or new automated systems or processes of a generic character.

Please indicate the budget request for each of these items and the amount requested of OMB for each of these items.

Answer: The NASA request to OMB for generic automation and robotics research and technology for FY 1984 was $3.6 million. This is the funding level included in the NASA Congressional budget request. The four key items in this program are: (1) fundamental artificial intelligence for decision making, information extraction, space operations expert systems and spaceborne symbolic processing; (2) application of artificial intelligence to uplink process control, knowledge-based command and control, fault detection and recovery, operations planning and scheduling, and environmental control and life support; (3) teleoperation and robotics machine vision and tactile/force feedback and (4) teleoperation and robotics interactive control, system simulation and autonomous supervisory control.

Aeronautics Systems Technology Programs

Question: In FY 1983, you requested $35.4 million for your Aeronautics Systems Technology programs. As a result of the Congressional action, your current Operating Plan for FY 1983 is $82.3 million. Your FY 1984 budget contains a request for $72.5 million for these programs. This represents a 12 percent decrease from the FY 1983 level.

What was your request to OMB for FY 1984 for Systems Technology?

What items would not be funded under your current budget request?

What has been your experience relative to industrial cost-sharing of this program -- that is, what percent of the program cost have been borne by industry?

Answer: The initial requests to OMB for Systems Technology were as follows:

	FY 1984 ($ in Millions)
Ongoing Programs	
Rotorcraft Systems Technology	$ 19.6
High-Performance Aircraft Systems Technology	19.9
Subsonic Aircraft Systems Technology	12.0
Advanced Propulsion Systems Technology	8.7
Augmentation	
Numerical Aerodynamic Simulation	$20.0
Advanced Composite Structures Technology	5.0
Small Engine Component Technology	4.0
Technology for Next Generation Rotorcraft	8.0
Large Rotorcraft Technology	2.0
Advanced Turbofan Research	5.0
Total Systems Technology Request to OMB	$104.2

The items which would not be funded under the current budget request are as follows from the Table above.

Subsonic Aircraft Systems Technology (Advanced Transport Operating Systems, formerly Terminal Configured Vehicle, and Laminar Flow Control)	$ 12.0
Advanced Propulsion Systems Technology	8.7
Small Engine Component Technology	4.0
Large Rotorcraft Technology	2.0
Advanced Turbofan Research	5.0

The Aeronautics Systems Technology program as submitted in the FY 1984 NASA Congressional budget request contains Rotorcraft, High-Performance and Numerical Aerodynamic Simulation line items totalling $67.5 million. Cost sharing by industry in these categories has never been sought. The remaining $5.0 million is for the Advanced Composite Structures Technology (ACST) program, in which case, instead of cost sharing industry will fund complementary programs at levels as high as 50 percent of the planned NASA activity.

Aeronautics Propulsion Systems Research and Technology

Question: In FY 1983, you requested $18.6 million for your Aeronautics Propulsion Systems Research and Technology program. In reallocating your resources in FY 1983 for your current Operating Plan, you reduced this amount to $16.6 million. In FY 1984, you are, however, requesting a level of $28.5 million or an increase of 72 percent over your current FY 1983 level.

Senator Garn—Continued

How do you account for this initial decrease in FY 1983 and then the large requested increase in FY 1984?

What percent of this propulsion system research and technology program is supported by DOD in FY 1984?

Answer: The FY 1983 changes in the Aeronautics Propulsion Systems Research and Technology between the requested budget and operating plan and the apparent large increase in FY 1984 are related to the fluctuations of the total aeronautics program in the FY 1983 budget process. When additional funds were provided in FY 1983 in Systems Technology for General Aviation/Commuter Engine Technology and Broad Property Fuels, $2.0 million of the R&T Base effort including small engine and fuels component experiments could be transferred to Systems Technology. The R&T Base funding was redirected to support critical computer science and applications and high performance aircraft program activities.

Resources were also added by the Congress in FY 1983 for the Advanced Turboprop program in Systems Technology but for FY 1984 the program was not approved and a decision was made to continue the supporting technology research in the R&T Base. Also, with the Energy Efficient Engine program funding being completed in FY 1983 and no Systems Technology funding for small engine component technology in FY 1984, the decision was made to conduct additional research in both large turbofan and small engine components in the FY 1984 R&T Base. The net effect of these changes was to increase funding in the R&T Base in line with FY 1983 Congressional direction.

No DOD funds are transferred to NASA to support NASA programs in Propulsion Systems R&T.

High Performance Research and Technology

Question: In FY 1983, you requested $35.7 million for your high-performance aircraft research and technology program. In FY 1984, you are requesting $38.6 million for this program. Your activities in FY 1984 mostly emphasize areas that are of importance to DOD, such as high angle-of-attack combat maneuver ability, high angle-of-attack flight characteristics and advanced short-take-off-and-landing concepts.

What percent of this program is supported by DOD?

Answer: The high performance aircraft R&T program is primarily supported by NASA resources with minor direct financial support from DOD. NASA's responsibility is to develop technology applicable to future civil and military aircraft. Most of this research is conducted far in advance of specific requirements which would justify military or industry funding support. In the military-related R&T, NASA's effort is augmented by DOD in that the program includes many joint or cooperative activities and involves joint use of assets such as engines, nozzles, simulators and aircraft and missile wind tunnel models. The NASA wind tunnel or simulator tests conducted for DOD or its contractors are generally supported by NASA resources because the results provide data of considerable value to the overall NASA research program.

Aeronautics Technology for Next Generation Rotocraft

Question: In FY 1984, you intend to initiate a new Systems Technology program entitled, "Technology for Next Generation Rotorcraft." Your budget contains a request for $8 million for this program.

What activities do you intend to undertake in this new program area and what funding do you expect to receive from DOD relative to this new initiative?

Answer: The $8 million in the new Systems Technology program entitled "Technology for Next Generation Rotorcraft" is directed primarily to the DARPA/NASA RSRA/X-Wing program with $2 million allocated to continue research using the XV-15 Tilt Rotor Aircraft to support DOD's JVX program. This tilt rotor research vehicle was jointly funded (approximately 50/50) by NASA and the U.S. Army. The major share of the NASA funding ($6 million) in the proposed initiative is for the modification of one of the NASA/Army RSRA (Rotor Systems Research Aircraft) to accommodate the X-Wing rotor system. DARPA will be transferring $28.3 million from FY 1983 and FY 1984 funds to NASA.

Numerical Aerodynamic Simulation

Question: In FY 1984, you are requesting $20 million for the Numerical Aerodynamic Simulation program. This program represents a new start for NASA in FY 1984. Could you please describe the uses of this computer facility and the cost and schedule involved in its development?

Answer: The Numerical Aerodynamic Simulation (NAS) program has as its primary goal the development of the capability required to carry out research and conduct design iterations essential to the future commercial and military leadership of U.S. aircraft. The development of modern civil and military aircraft depends increasingly on massive and rapid fluid dynamic computations. Neither the solution methods nor the computers are currently available to enable the types of aerodynamic predictions which are needed. It is not possible today to solve for the complete three dimensional flow about a complete aircraft or within the stages of a modern turbine engine. For example, the inability to understand flow behavior within the turbulent drag, which offers reduction potential of up to 50 percent. The exploitation of computational aerodynamics will provide benefits to all phases of aeronautical research and development from basic fluid flow to refinement and optimization of full aircraft configurations.

The NAS program will serve as a powerful pathfinder in basic research where solutions of the full Navier-Stokes equations will reveal underlying mechanisms of turbulence, flow separation and reattachment, and aerodynamic noise. This understanding will contribute to the design of quieter and more efficient aerospace engines and airframes required for continued U.S. aerospace preeminence. The NAS capability will allow similar advances in other computationally dependent disciplines such as structures and structural dynamics, heat transfer, chemistry, and weather and climate modeling.

Our basic commitment is to maintain NASA in a position of international leadership in computational fluid dynamics, and the schedule is paced to take advantage of advances in computer science within U.S. industry. The NAS schedule to meet this intent is most directly expressed in terms of the system utility (speed and memory) of the high speed processor. Initially, in 1984, the available computational speed is planned to be 250 million floating point operations per second with 64 million words of high speed memory. By 1987, this capability is planned to increase to one billion floating point operations per second, with 256 million words of high speed memory. Beyond 1987, as more advanced high speed processors become available, they will become incorporated into the NAS system.

The cost of the NAS program for FY 1984 to 1988 is $116 million (in 1984 dollars) with $20 million required in FY 1984. Reduction from this level will make it impossible for the Agency to maintain its lead in computational fluid mechanics.

Question: You note in your budget justification that the first year funding for the facility will enable considerable progress towards the implementation and testing of a user friendly peripheral system.

Why is the development of a user peripheral system important at this point in the development and design of the simulation facility?

Answer: The NAS computational system consists of two elements: (1) the high speed processor, and (2) a network peripheral processing system which is the interface between the user and the processor. Both elements are essential.

The schedule for the high speed processor calls for an initial capability in 1984 of 250 million floating point operations per second, with 64 million words of high speed memory. The capability will grow in 1987 to one billion floating point operations per second, with 256 million words of high speed memory. In order to reach these milestones, the capabilities of both the prototype high speed processor and the network peripheral system must proceed in parallel.

The user friendly network peripheral system is essential to productive use of the high speed processor and to the support of users at diverse locations within NASA, other agencies, universities, and industry. Equally important, the network peripheral system is essential to incorporation of advanced prototype high speed processors with differing architectures.

The peripheral system must provide a simple, user-friendly interface between user and processor, while efficiently controlling high speed processors, large quantities of input and output data, and complex analysis methods. Robust analysis and display systems are needed to provide the user with the ability to interpret the results and to avoid blind alleys in seeking research solutions. Further, the network peripheral system must support evolving processor architectures and is essential to the incorporation of advanced prototype hardware and software from U.S. processor and peripheral equipment manufacturers. Because of its long lead time for development, the design of a prototype network peripheral system work has already commenced to meet the first prototype processor delivery schedule in 1984. Any delay in the development of the NAS peripheral system will result in an equivalent delay in the initial NAS operating capability.

Question: One of the potential uses you have identified for the Numerical Aerodynamic Simulation program is the design of missiles and other DOD-related activities.

How much of the potential use of the system is expected to be DOD-related?

Is DOD contributing any funds towards the development of the system?

Has NASA developed a pricing policy for the use of the system once it is available?

What would not be accomplished if we only provided $10 million in FY 84?

Answer: NAS applications are anticipated to be 90 percent for fluid dynamic and aerodynamic applications and about 10 percent for other computational physics applications. Overall, it is anticipated that two-thirds of NAS use will support basic research, and one-third applications research. The thrust of the use of NAS will be to achieve greater understanding of fluid flow phenomena and to develop predictive solutions which can be used by designers of missiles and civil and military aircraft. Our forecast of NAS users is as follows:

55 percent	NASA
20 percent	DOD
15 percent	Industrial
5 percent	University
5 percent	Other Government Agencies

It is planned that the NAS funding would be provided solely by NASA. NASA has traditionally provided the leadership role in computational aerodynamics and it is essential to U.S. preeminence in aeronautical R&T that the Agency continue its leadership role. The NAS program is fundamental to the NASA role in aeronautics in the same way as the development and use of its wind tunnels. Such research activities are defined and included as NASA's role in the Office of Science and Technology Policy (OSTP) study which led to the National Aeronautics Policy statement of 1982.

NASA is planning a pricing policy for the use of the NAS system consistent with its policy for the use of wind tunnels. Briefly, no charge would be made for basic and applications research which support NASA's leadership role in aeronautical research; however, appropriate charges would be made for use of the NAS system to support proprietary designs.

The NAS program consists of two primary elements: (1) the high speed processor, and (2) a network peripheral processing system which is the interface between the user and the processor. Both elements are essential. The basic commitment to maintain NASA in a position of international leadership in computational fluid dynamics is paced by industry advances in computer science. The acquisition plans for the components and software for the two NAS elements are based on the availability windows provided by the U.S. computer industry.

The NAS schedule for the high speed processor calls for an initial capability in 1984 of 250 million floating point operations per second, with 64 million words of high speed memory. The capability will grow in 1987 to one billion floating point operations per second, with 256 million words of high speed memory. In order to reach these milestones, the development of the capabilities of both the prototype high speed processor and the network peripheral system must proceed in parallel.

Partial funding for NAS in FY 1984 would delay implementation of the initial NAS capability by at least one year and could jeopardize the entire program. FY 1984 funding will be directed at the two major parallel elements: (1) $13 million for build up of the NAS network peripheral system and installation of the operating system, and (2) $7 million for procurement of the initial high speed processors and connection to the NAS network. The NAS network is required for user access to the high speed processors. An advanced prototype high speed processor will be available to NASA in FY 1984. A reduction in funding could result in missing the prototype processr acquisition window which is crucial to remaining at the forefront of the application of advanced computer technology to aeronautics. Both elements, the system network and the high speed processors which it hosts, must be brought along together and require the $20 million funding in FY 1984.

In a broader context, such reductions would cripple the NAS program at a crucial time, when there are threats from the Japanese to the American scientific computer industry and from both Europe and Japan to our transport aircraft manufacturers. The Japanese Ministry of International Technology and Industry (MITI) has provided funding since 1982 for a National Super-Speed Computer Project (NSCP) with a total funding through 1989 expected to be $200 million. Besides Europe, such computers would be available to the Soviet Union. Furthermore, the ability of foreign competition to apply state-of-the-art supercomputers to aircraft design makes it imperative to U.S. industry that NASA provide the pathfinder role in aeronautics with the NAS system.

Computer Science and Electronics Research and Technology

Question: This year you are requesting $16,300,000 for your Computer Science and Electronics Research and Technology program. One of the items you intend to demonstrate during 1984 is the replacement of spacecraft controllers by expert systems. In addition, you intend to design an automatic environmental control and life support system for space applications. Several other robotic systems, including robotic vision, will also be demonstrated during FY 1984.

Could you please describe the expected uses of these systems and when the prototypes might be available?

Answer: NASA research and technology in the fields of automation and robotics will have numerous applications within the Agency. Additionally, this generic research and technology has application to improvement in the productivity of U.S. industry as indicated in our testimony before the House of Representatives' Subcommittee on Investigation and Oversight, Committee on Science and Technology hearing in June, 1982.

Automation technology demonstrations include a program called DEVISER which will be used for planning the Voyager encounter with Uranus in 1986 and for constructing spacecraft sequences for the Galileo Probe. Additional potential applications include command and control of earth-orbiting spacecraft and scheduling of Shuttle operations. Automation technology for environmental control and life support systems are targeted at providing on-orbit autonomous control of major subsystems by the late 1980's. A major application for autonomous subsystems would be a U.S. space station. In addition, NASA is working jointly with the Air Force to apply autonomous subsystem capability to free-flying spacecraft. Tools for the autonomous extraction of information from space-acquired data are being developed to support the scientific research community.

Robotics technology is targeted on a potential teleoperator system to augment the Space Shuttle's space operations capability. The Remote Orbital Servicing System (ROSS) concept, developed through a contract between NASA's Langley Research Center and Martin Marietta, is our current focus. It is a dual manipulator system, operated by a ground-based (or space-based) work station. Our research efforts involve the investigation of concepts for direct manned control of the systems involving the integration of vision, force, and range information into the robot's control system. A computerized simulation capability which provides analytical evaluations to verify system performance has achieved its initial operational capability.

Controls and Human Factors Research and Technology

Question: In your FY 1983 budget request, you asked for $1.5 million for your Controls and Human Factors Research and Technology program. Your current estimate for this program in FY 1983 is now $6.8 million.

Could you please explain what specific activities you intend to undertake during FY 1983 at the $6.8 million level that you would not have been able to undertake at the $1.5 million level?

How much of the additional $5.3 million allocated to this program in FY 1983 is related to your space station program?

Answer: Specific activities intended to be undertaken in FY 1983 at the $6.8 million level, that we would not have been able to undertake at the $1.5 million level include generic controls research, spacecraft controls, space station controls and guidance, advanced space vehicle controls, and human factors.

In the area of generic controls research, a number of university grants will be established to study adaptive control of flexible structure, reliability studies of control components, distributed parameter identification and modeling, state estimation theory, and laboratory experiments.

In the area of spacecraft controls, the control system of a large space antenna system will be synthesized to establish performance requirements, technology needs, implementation approaches, and simulations of control designs. Tasks also include sensor development for fiber optics gyro and advanced fine guidance sensors.

The space station controls and guidance effort will be expanded to include multi-platform control, applied systems identification and adaptive control, distributed control for an evolving space station, and advanced components for sensing and momentum control.

A new effort in advanced space vehicle controls will focus on the development of control and guidance concepts to reduce the cost of future space vehicles such as an advanced Shuttle. Tasks include a study of expanding the orbiter controls envelope to accommodate attached bodies (Large Space Structures), on-orbit satellite servicing, and control software interactive with system concepts.

Another activity being initiated is space human factors research. Tasks include basic methodology development for space human factors, human factors development for teleoperator and extra-vehicular activities, manned control of remote operations, and ground control and operations human factors.

Of the additional $5.3 million allocated to this program in FY 1983 approximately $2.3 million is related to the space station program (Controls $1.4 million and Human Factors $0.9 million).

Human Factors Criteria for Head-Up Displays

Question: One of the activities you intend to undertake in your Controls and Human Factors Research and Technology program during 1984 is the development of human factors designed criteria for head-up displays.

How much money had NASA spent on the head-up display problem in the last five years?

How much money do you have allocated in your FY 1984 budget for this research?

When was the first head-up research conducted in aviation?

How much is the Department of Transportation devoting to head-up in FY 1984?

How much is the Department of Defense making available for this research in FY 1984?

What specific new activities does NASA intend to undertake in the head-up display area in FY 1984?

Answer: In the last five years, NASA spent $800,000 on a joint program with the FAA to respond to an National Transportation Safety Board (NTSB) request for a data base on the use of head-up displays (HUD's) in commercial air transport aircraft as a primary display for use in manual approaches during low visibility. This study focused on the format of the display rather than the hardware to be used.

In 1983, an exploratory study was undertaken to determine whether the hardware technology for helmet-mounted HUD developed by the military was applicable for use by suited astronauts performing extra-vehicular activities. The level of this study is $50,000.

NASA also developed a HUD for use in the Space Shuttle. It has been installed on the Columbia and will later be installed on the Challanger as well as future orbiters.

The joint NASA/FAA program referred to above has been completed and no further funding is planned.

$50 thousand is planned to continue exploratory research on a helmet mounted HUD for use by suited astronauts performing extra-vehicular activities such as satellite servicing and large structure assembly.

No further development of HUD's for Shuttle orbiters is anticipated.

HUD research for the military began in the mid-to late 1950's. For civil operations, it began in the early 1960's.

The FAA has indicated that it plans to sponsor research on the use of HUD's in commercial air transports to monitor automated landing systems in FY 1984. However, the funding levels have not been established.

The Naval Air Development Center has a research program aimed at helmet mounted HUD's for use in military oriented pilot tasks such as weapons delivery. Indications are that they plan to spend about $400,000 in this area in FY 1984.

The Air Force Aerospace Medical Research Laboratory at Wright-Patterson AFB is also performing research on HUD's for military pilot tasks. However in the time available, their planned FY 1984 funding could not be ascertained.

In FY 1984, NASA does not plan to undertake any new activities in the HUD area.

National Academy of Sciences Review Committee

Question: On page RD-13-32 of your budget justification, you indicate that in FY 1984 you will continue to make funds available for special Congressional or NASA directed tasks. These studies would be carried out by the National Academy of Sciences and Engineering through the mechanism established by the Congressional Appropriations Committees several years ago.

How much have you earmarked in your FY 1984 budget for this effort?

Answer: $100,000 has been earmarked for FY 1984.

Aeronautics and Sounding Rockets Support System Implementation

Question: In FY 1983, you requested $3.8 million for your Aeronautics and Sounding Rockets Support System Implementation. In FY 1984, you are requesting $8.1 million for this program.

Please provide for the record the specific activities that will be augmented in FY 1984.

Answer: The budget request for FY 1984 will enable the Office of Space Tracking and Data Systems to support anticipated growth in flight research activities at the Dryden Flight Research Facility (DFRF), and to also rehabilitate old tracking and data acquisition equipment at the Wallops Flight Facility (WFF).

Additional funding of approximately $2.0 million will provide DFRF with a second telemetry acquisition system as well as a new post-mission processing system which will provide support of two missions simultaneously.

At WFF, we plan to rehabilitate three existing old radars in order to maintain their accuracy and improve reliability. This action will require the tear down and replacement of worn parts as well as recalibration of systems and subsystems. The approximate cost for this action is about $2.0 million.

Aeronautics Terminal Configured Vehicle Program

Question: One of the programs you requested to be discontinued in FY 1983 was your Terminal Configured Vehicle program. This program was designed to, among other things, increase air traffic flow capacity and improve operational capability in adverse weather.

What activities do you expect to undertake during FY 1983 in this program area?

Answer: In FY 1983, NASA is continuing research activity supporting urgently needed research in airplane systems that interface with the air traffic control and air navigation systems, and optimizing the design of the flight station. The flight station is important because it is the place where the pilot, as a system integrator, must interface with virtually all aircraft systems. As an example of this type of activity, NASA, in cooperation with FAA, completed a complex approach path study in March, 1983, entitled "The Microwave Landing System Service Test and Evaluation Program (MLS STEP)".

Wind Tunnel Testing

Question: On December 9, 1982, an accident occurred in the 80x120 foot leg of the Ames Subsonic Wind Tunnel. On February 2, you informed us that you had exercised your authority to make emergency repairs.

How much money have you transferred from your Construction of Facilities (CofF) account for this purpose?

What CofF projects will be impacted and to what extent?

How will this transfer affect your use of FY 1984 CofF funds?

Please bring us up-to-date on the status and expected costs of the wind tunnel repairs.

Answer: To date, $11.6 million has been allocated to the emergency repair.

The funds allocated have been drawn from residuals to projects authorized and appropriated in over a decade of the NASA Construction of Facilities program (FY 1982 and prior). The $11.6 million is less than one-tenth of one percent of the associated $1.3 billion appropriations for those same years. Because these funds are residuals to completed or nearly completed projects, there has not been any adverse impact on any of the projects.

There will be no effect on our use of FY 1984 CofF funds.

The repairs are expected to cost approximately $12 million.

New fan blades have been ordered and will be delivered by the summer 1984. The six fan drive motors are being examined in detail for any damages. Several concepts for replacement of the turning vane set have been tested, and the most promising concept is being developed into a preliminary design.

We expect the repairs to be completed by the end of 1984.

Question: Please indicate the total amount contained in your FY 1984 budget for wind tunnel testing during FY 1984.

How much of this testing was planned to be conducted in the 80x120 wind tunnel that recently was put out of commission?

Could these tests be done elsewhere and, if so, what would the cost be?

Answer: The total amount contained in the NASA FY 1984 Aeronautical Research and Technology budget for wind tunnel operations is $36 million.

For the 40x80x120-foot wind tunnel facility, a total of $2.3 million was (and still is) planned for FY 1984 for R&D support contract services and supplies.

The research program has been revised to more fully utilize the 7x10-foot wind tunnel and the Outdoor Aerodynamic Research Facility (OARF) as well as to conduct some tests in the 40x80-foot test section with "wind off" and at suitable alternative facilities at Ames or Langley. There is no additional cost.

Tracking and Data Relay Satellite System and Ground Station Closings

Question: In describing your Tracking and Data Acquisition program for FY 1984, you note that once the Tracking and Data Relay Satellite System (TDRSS) becomes operational, "a number of ground stations will be closed."

Could you please provide for the record a list of the ground stations you expect will be closed, the expected annual savings, the effect on NASA Full Time Employee Equivalent (FTEE) and the schedule dates for these closings?

Answer: Once the Tracking and Data Relay Satellite System (TDRSS) is operational, we plan to cease operations at Ascension Island, Santiago, Guam, Hawaii, Dakar and Botswana, and terminate the VHF air-to-ground capability at Yarragadee, Australia, and the Air Force Indian Ocean station. The timing of these actions prior to the STS-6 mission was expected to be about April, 1984. Through these closures, we expect to achieve an annual savings of approximately $42.0 million (expressed in FY 1984 dollars). The reduction in ground network contractor personnel is approximately 540 FTEE.

Space Station Funding Status

Question: In February, you provided the Subcommittee with a chart summarizing the space station funding for FY 1983 and FY 1984. The chart also contained references to the budget justification book indicating where those activities were described. Could you please supply this table for the record?

Answer: See enclosure 6.

Question: That table indicated that a total of $33.4 million would be available in FY 1983 and $43.4 million in FY 1984. Of this amount, $4.2 million in FY 1983 and $14 million in FY 1984 are specifically designated for the space station -- rather than generic research and technology.

What was your request to OMB in FY 1984 for non-generic technology related space station funding?

What specific programs and activities could not be undertaken at the $14 million level that would have been performed given the approval of your request to OMB?

Answer: The total NASA request to OMB for space station was $63 million (not including generic technology). Of that amount $30 million was for non-generic technology augmentation; $30 million was for advanced development and supporting studies; and, $3 million was for potential utilization of scientific payloads on the space station.

Specific technology augmentation and advanced technology development activities have been deferred in the following areas: control and data management system, electric power (acquisition, storage, and distribution) system, thermal management system, on-board propulsion system, and regenerative life support system.

The advanced development activities consist of the prototype and brassboard testing of the most promising technology concepts.

[CLERK'S NOTE: The following six enclosures were provided by the National Aeronautics and Space Administration.]

(ENCLOSURE 1)

MMU (MANNED MANUEUVERING UNIT) REQUIREMENTS

- OPERATIONAL
  - OPERATE IN NEAR VICINITY OF ORBITER
  - MODULAR DEVICE ATTACHED TO EMU (EXTRAVEHICULAR MOBILITY UNIT)
  - EMU PROVIDES VOICE COMMUNICATIONS, NO MMU TELEMETRY REQUIRED
  - ONE MAN DON/DOFF/SERVICE WHILE EVA
  - SUPPORT 6 HOUR EVA

- SYSTEM
  - MANUAL TRANSLATION AND ROTATION CONTROL WITH AUTOMATIC ATTITUDE HOLD
  - 66 FEET/SEC DELTA VELOCITY WITH INITIAL CHARGE, RECHARGED ON-ORBIT AS REQUIRED
  - NON-CONTAMINATING GASEOUS NITROGEN USED FOR PROPELLANT
  - FAULT TOLERANT SYSTEM ALLOWS ISOLATION OF ANY SINGLE FAILURE AND:
    - RETURN TO ORBITER ON BACKUP SYSTEM FOR NON CRITICAL MISSIONS
    - OR CONTINUE MISSION ON BACKUP SYSTEM FOR CRITICAL MISSIONS (BACKUP SYSTEM FAILURE REQUIRES RETRIEVAL BY ORBITER OR SECOND MMU)
  - CAPABLE OF TRANSFER THRU ORBITER HATCHES
  - FSS (FLIGHT SUPPORT STATION) IN PAYLOAD BAY HOLDS MMU FOR LAUNCH, ON-ORBIT DON/DOFF/SERVICE, ENTRY, AND LANDING
  - MMU WEIGHT 330 POUNDS, FSS WEIGHT 170 POUNDS

(ENCLOSURE 2)

ANNED MANEUVERING UNIT
USERS GUIDE

APRIL 1982

ABBREVIATION AND ACRONYMS

AAH	Automatic Attitude Hold
CB	Circuit Breaker
CEA	Control Electronics Assembly
CM	Center of Mass
DCM	Display and Controls Module, of EMU
ΔP	Delta Pressure
dps^2	Degrees per second per second
ΔV	Delta Velocity, equivalent in translation
EMU	Extravehicular Mobility Unit
EVA	Extra Vehicluar Activity
fps	feet per second
FSS	Flight Support Station
GN_2	gaseous nitrogen
IVA	Intra Vehicular Activity
Kg	Kilograms
LDEF	Long Duration Exposure Facility
LED	Light Emitting Diode
MMU	Manned Maneuvering Unit
MWS	Mini Work Station, of EMU
PLB	Payload Bay
PLSS	Primary Life Support System
psi	pounds per square inch
QD	Quick Disconnect
RCS	Reaction Control Subsystem, of Orbiter
RHC	Rotational Hand Controller
RMS	Remote Manipulator System
SOS	Space Operations Simulator
SPMS	Small Payload Maneuvering System
STS	Space Transportation System
THC	Translational Hand Controller
t_{min}	minimum time curve, for MMU translation
TPS	Thermal Protection System, of Orbiter
WETF	Weightless Environment Training Facility

1.0 INTRODUCTION

1.1 Purpose

The purpose of this document is to provide potential Manned Maneuvering Unit users with information for assessing the utility of the MMU for specific on-orbit EVA tasks, and to provide guidance for the development of preliminary plans for MMU support of Shuttle EVA operations.

1.2 Background

Extra Vehicular Activity (EVA) is a standard Space Shuttle service that can provide exceptional advantages for many missions. The EVA crewmember has diagnostic and manipulative power which can be focused at the site of the mission action in real time. Significant payoffs can result, such as decreased payload design complexity, enhanced mission flexibility, and greater success probability for planned or contingency situations.

The MMU further enhances the advantages of EVA by allowing the Shuttle crew to operate beyond the confines of the payload bay - to fly to any part of the Shuttle or to nearby free-flying payloads or structures. This independent mobility can be used to support a wide variety of activities including free space transfer of cargo and personnel, inspection and monitoring of orbital operations, and construction and assembly of large space structures.

The projected MMU orbital operations support capabilities are based on the results of the Skylab M509 Experiment, which demonstrated the maneuverability and precise controllability of this type of personal maneuvering system. Five astronauts accumulated a total of 14 hours flying time during eleven tests of the M509 experimental MMU on the second and third Skylab flights. See Reference 1.

2.0 SPACE SHUTTLE EVA PROVISIONS

The MMU is part of the total complement of Shuttle EVA provisions that include the Extravehicular Mobility Unit (EMU), the Orbiter Airlock, and support equipment. This section describes EVA hardware along with the groundrules and guidelines to be followed when using the hardware.

2.1 Manned Maneuvering Unit

The MMU is a zero-gravity, self-contained backpack mobility system designed for astronaut extravehicular activity. The MMU is built by Martin Marietta under contract NAS9-15999 to NASA Johnson Space Center. It is stowed in the orbiter cargo bay for launch and re-entry, as shown in Figure 2-1, and can be readily donned, doffed, and serviced by one crewmember.

The MMU utilizes twenty-four fixed position, gaseous nitrogen (GN_2) thrusters to provide complete six degree-of-freedom maneuverability. The unit is designed as a fully redundant, fail-safe system such that no single credible failure could prevent the EVA crewmember from returning to the Shuttle payload bay, thus eliminating the need for tethers and other attachments. When Orbiter retrieval capability is considered, the MMU is fail-operational, fail-safe.

To use the maneuvering unit, a suited astronaut exits the crew compartment through the airlock into the cargo bay. The astronaut then dons the backpack by latching the Portable Life Support System (PLSS) of the Extravehicular Mobility Unit (EMU) into the MMU, Figure 2-2, and releases himself from the Flight Support Station (FSS), Figure 2-3.

Commands to operate the thrusters are input through translational and rotational hand controllers (THC, RHC) located at the ends of the left and right control arms, respectively. Translations and changes in attitude are accomplished by moving the hand controller grips to produce the desired thrust impulses. A Control Electronics Assembly (CEA) converts the hand controller inputs into commands to operate the appropriate thrusters for acheiving the desired maneuver. In addition to manual control, an Automatic Attitude Hold (A.A.H.) function is available to maintain the MMU in an inertial attitude during flight by using thrusters to automatically counter induced rotations as sensed by small gyros.

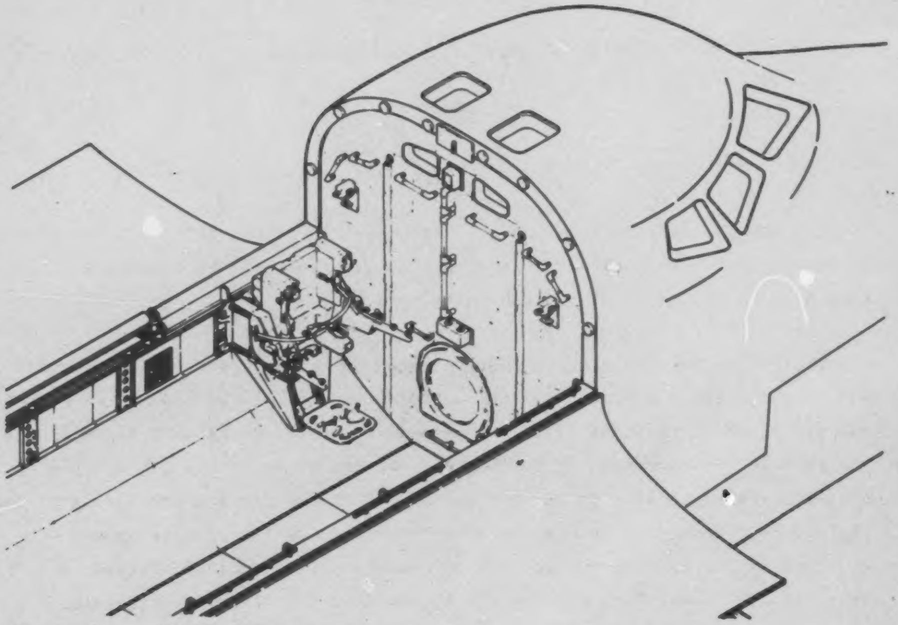
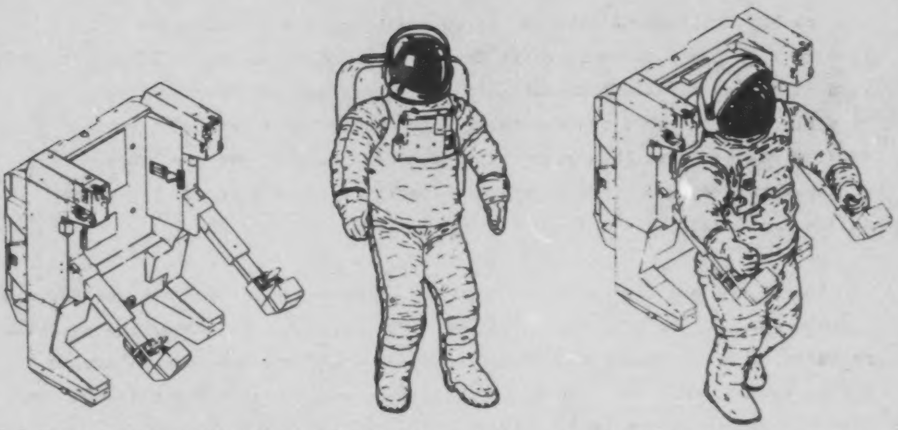
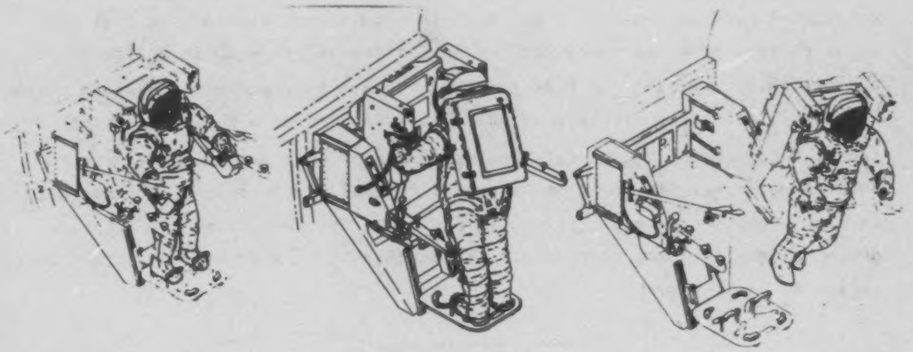


Figure 2-1 MMU/FSS Location in Cargo Bay



(a) Manned Maneuvering Unit (b) EMU and PLSS (c) MMU Latched to PLSS

Figure 2-2 Manned Maneuvering Unit EVA System



Don/Doff Configuration Servicing Configuration Egress/Ingress

Figure 2-3 MMU Flight Support Station

The MMU is designed to support a six hour EVA without battery recharging or replacement. Recharge of the GN_2 propellant tanks may be necessary, depending on the particular tasks being performed.

The Flight Support Station (FSS) mounted on the port side of the forward end of the Orbiter payload bay houses the MMU during all periods it is not in use and provides the capability for propulsion system recharging as well as a location for MMU donning and doffing and battery replacement. Future plans call for the capability to carry a second MMU/FSS on the starboard side of the payload bay, depending on mission requirements. GN_2 for recharging and electricity for heating FSS and MMU components during orbital storage is provided by the Orbiter, through the FSS-Orbiter Electrical/GN_2 interface panel. Temperature sensors on the MMU and FSS provide data to the Orbiter Caution and Warning System during orbital storage.

The MMU is approximately 127 centimeters (50 in.) high by 84.6 centimeters (33.3 in.) wide by 68.6 centimeters (27 in.) deep with the arms folded, 122 centimeters (48 in.) deep with the hand controllers arms fully extended for flight as shown in Figure 2-4. The unit is small enough to pass through the Orbiter airlock and side hatch, and can be maneuvered with ease around and within complex structures. Ground simulations and experiments with the M509 unit have shown that, with this type of maneuvering system, it is possible to stationkeep within a few inches of a structure or surface and to translate along that surface without danger of making contact.

Performance characteristics of the MMU, such as total weight, moments of inertia, and acceleration rates are contained in Table 2-1. Additional performance data is described in Section 6 of this docubent.

TABLE 2-1 EVA MASS PROPERTIES AND MMU PERFORMANCE

Weights

MMU with Full Propellant	148.4 kg	(327.1 lbs)
50th percentile male	77.1 kg	(170.0 lbs)
EMU - Medium	103.1 kg	(227.2 lbs)
EMU Helmet TV Camera (optional)	6.1 kg	(13.5 lbs)
EMU EVA Lights (optional)	2.9 kg	(6.5 lbs)
EVA Mission	337.6 kg	(744.3 lbs)

Moments of Inertia

Ix = 56.4 kg-m^2 (41.6 slug-ft^2)
Iy = 57.9 kg-m^2 (42.7 slug-ft^2)
Iz = 32.7 kg-m^2 (24.1 slug-ft^2)

Products of Inertia

Pxy = 0.07 kg-m^2 (0.05 slug-ft^2)
Pxz = 2.28 kg-m^2 (1.68 slug-ft^2)
Pyz =-0.04 kg-m^2 (-0.03 slug-ft^2)

Acceleration Rates

Linear: a = 0.09 m/sec^2 (0.294 ft/sec^2)
Rotational: Pitch = 7.98 deg/sec^2
Yaw = 9.06 deg/sec^2
Roll = 8.19 deg/sec^2

Available Propulsive Forces and Torques

Linear: F = 30.25 Newtons (6.80 lb)
Rotational: Pitch = 0.67 N-m (5.95 ft-lb)
Yaw = 0.21 N-m (1.91 ft-lb)
Roll = 0.67 N-m (5.95 ft-lb)

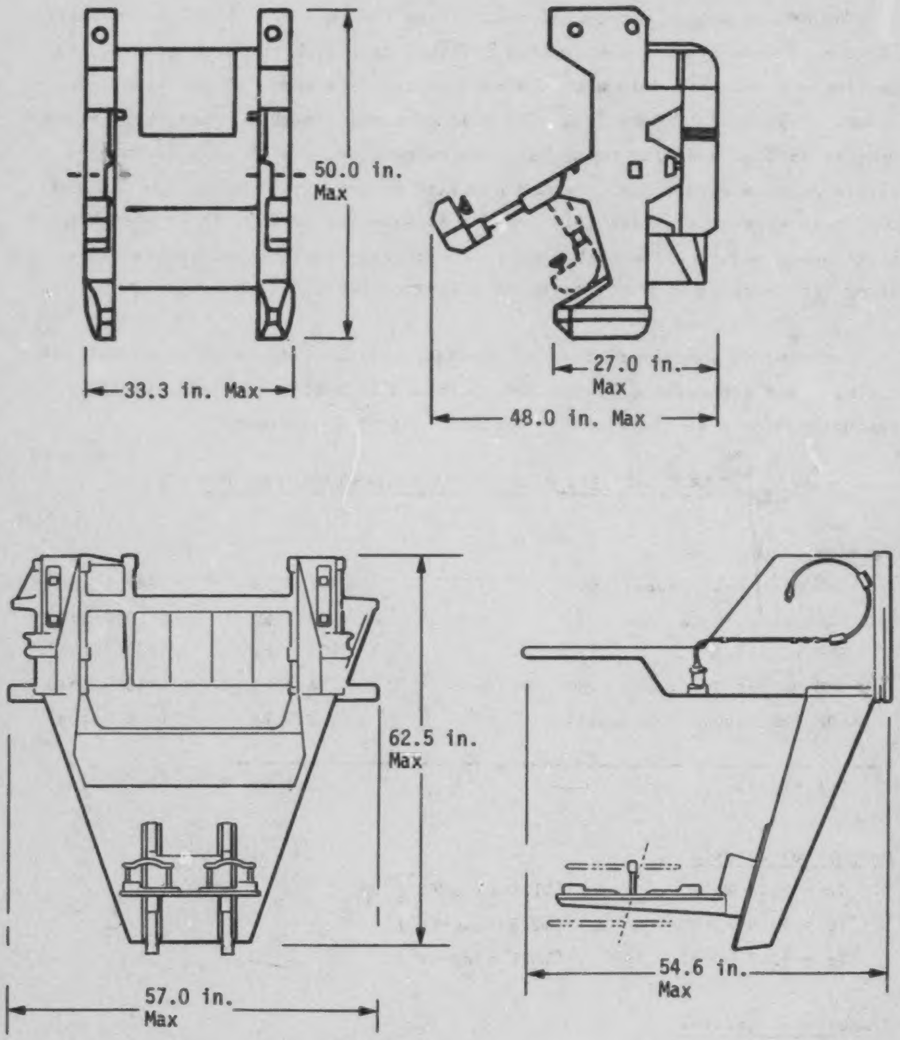


Figure 2-4 MMU and FSS Envelope Dimensions

2.2 Extravehicular Mobility Unit and Airlock

The EMU is an independent, anthropomorphic system that provides environmental protection, life support, mobility, and communications for the EVA crewmember to function in the space vacuum environment. The major subsystems of the EMU are the Space Suit Assembly (SSA) and the Primary Life Support System (PLSS). See Figures 2-5 and 2-6.

The EMU provides a protective and supportive environment for the EVA crewmember for up to six working hours per EVA. Thermal, optical, and micrometeoriod protection is provided. Breathing oxygen and suit pressure is maintained at 2816 Kilograms per square meter (4 psia). Suit sizing accommodates stature range from 5th percentile female to 95th percentile male. Mobility is provided for the shoulder, elbow, wrist, fingers, waist, hip, knee, and ankle. Voice communication is provided between the Orbiter and two EVA crewmembers. Figure 2-7 illustrates the complete EMU system.

The airlock is used by the Shuttle crewmembers for transition between the shirtsleeve cabin environment and the space vacuum environment without depressurizing the cabin. It is a modular, cylindrical structure with two D-shaped, pressure sealing hatches as shown in Figure 2-8. Mating hatches are located in the Orbiter X_o=576 bulkhead or on the side of the payload tunnel adapter, when the Spacelab is flown. The airlock can be installed inside or outside the cabin depending on mission requirements. Location inside the middeck compartment allows maximum use of the payload bay volume, and is the normal configuration.

The airlock provides for stowage and donning/doffing of the EMU. A portable oxygen system allows the crewmember to prebreathe oxygen for denitrogenization when transferring from the cabin air environment to the lower pressure EVA environment. The airlock also contains a battery charger for charging the EMU and MMU batteries and facilities for replenishing the EMU water supply.

2.3 Extra Vehiclular Activity Guidelines and Groundrules

EVA is defined as all activities that involve an EMU-equipped crewmember in the space vacuum environment.

EVA is divided into two basic categories:

1. Scheduled - EVA scheduled prior to launch to support Shuttle or payload mission objectives.
2. Unscheduled - EVA not scheduled, but which may be required to achieve payload mission objectives or to effect the safe return of the Orbiter and crew. To the maximum extent possible, all potential "unscheduled" EVA tasks will be pre-planned and the crew will have been pre-trained in their execution.

On each orbiter flight, provisions will be made for the equipment and consumables for three two-man EVA operations, each lasting a maximum of six working hours, plus one-half hour for egress/ingress and a one-half hour reserve. Two of the EVA's are available for payload operations and the third is retained for Orbiter contingency EVA. Additional scheduled EVA's can be added as required by the user.

The MMU will be flown on all rescue missions, and on other missions by request of the user. The MMU is capable of supporting one or more full six-hour EVA's.

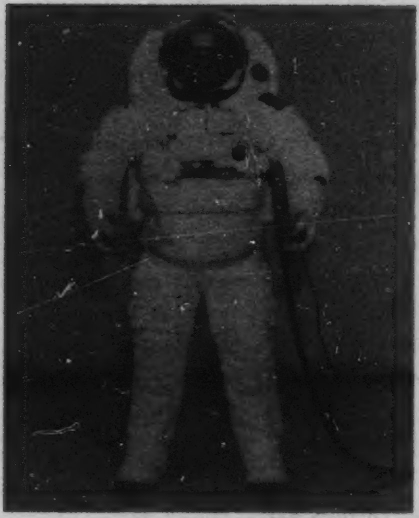


Figure 2-5 Shuttle Space Suit (EMU)

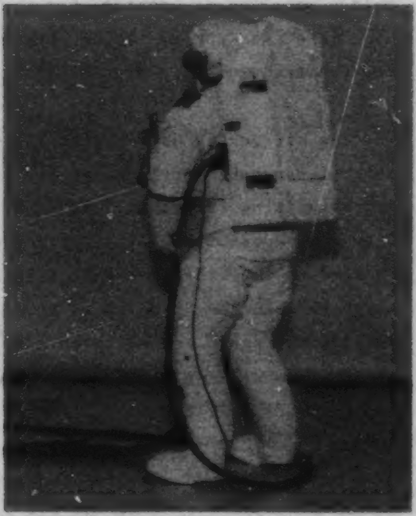


Figure 2-6
Primary Life Support System (PLSS)

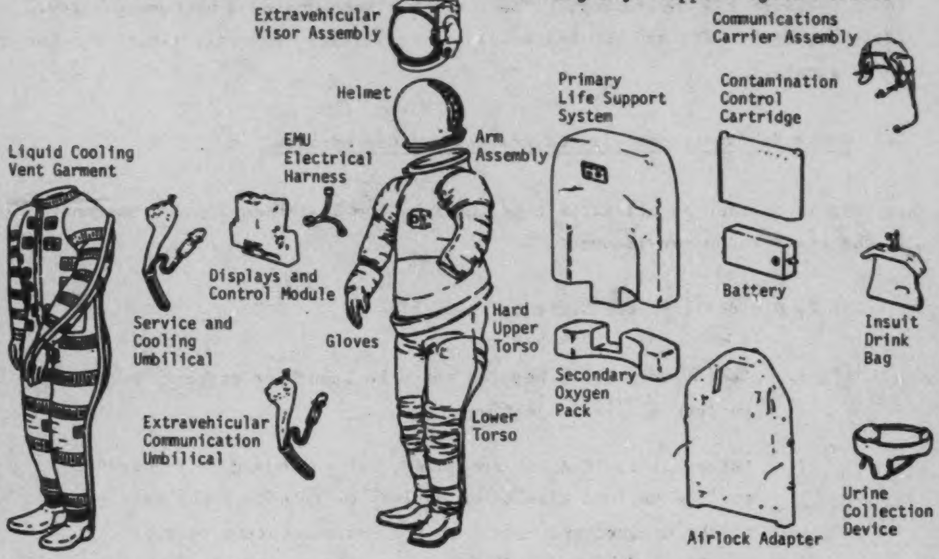

Extravehicular Visor Assembly
Communications Carrier Assembly
Helmet
Primary Life Support System
Contamination Control Cartridge
EMU Electrical Harness
Arm Assembly
Liquid Cooling Vent Garment
Displays and Control Module
Battery
Service and Cooling Umbilical
Gloves
Hard Upper Torso
Insuit Drink Bag
Secondary Oxygen Pack
Extravehicular Communication Umbilical
Lower Torso
Urine Collection Device
Airlock Adapter

Figure 2-7 EMU System

The following general guidelines and constraints apply to MMU EVA operations:

1. **EVA operations are normally performed by two EVA-trained crewmembers. However, one-man EVA is an option in the event of equipment failure, safety, or flight contingencies with a two-person crew.**

2. **The MMU is fail-operational, fail-safe for one-man untethered EVA. No single credible failure can prevent the completion of**

the assigned mission, and no two credible failures can prevent the crewmember from returning to the Payload Bay. In the event of two MMU failures, the Orbiter will be maneuvered to retrieve the EVA crewmember. On non-critical missions, operational groundrules may require that the EVA crewmember return to the Orbiter after one MMU failure.

3. Planned EVA periods will not exceed one six-hour duration per day (excluding the time required for EVA preparation and activities);

4. EVA may be conducted during both light and dark periods;

5. EVA is not constrained to ground communication periods.

Additional EVA criteria are found in reference 2.

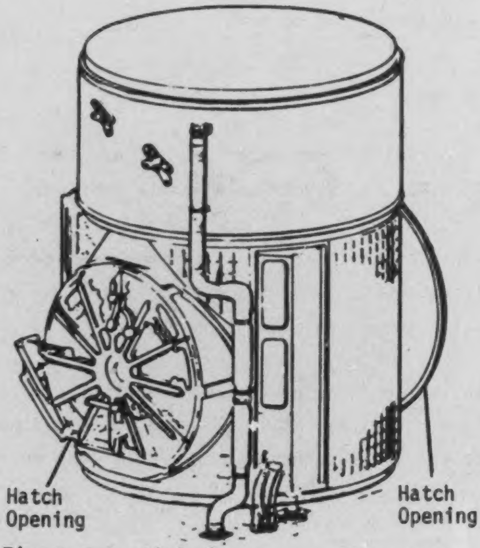


Figure 2-8 Airlock

3.0 MMU EVA UTILITY

The MMU is provided by NASA as Space Shuttle EVA support equipment and will be available for use by any payload on any scheduled mission beginning with operational flights in early 1983. It can be used for EVA support, orbital operations support, and EVA rescue operations. Typical tasks which the MMU can support are listed below.

Shuttle EVA Support

a. External inspection of the Orbiter;
b. Documentary photography/television.

Shuttle Payload Support

a. Payload deployment or retrieval;
b. Adjustment of instruments;
c. Retrieval and replacement of film, coatings, emulsions;
d. Servicing free-flying payloads;
e. Replacement of failed modules;
f. Cleaning sensors and lenses;
g. Assembly of large structures;
h. Routing of cables or lines between discontinuous points;
i. Application of spray coatings;
j. Removal of contamination protective covers;
k. Malfunction assessment and corrective action.

Crew Rescue Support

a. Support the transfer of crewmembers and/or equipment in a rescue/repair situation involving a stable orbiter;

b. Provide a means for the transfer of crewmembers and/or equipment in a rescue/repair situation involving either a tumbling orbiter or a disabled foreign manned vehicle.

The following illustrations depict various tasks which an EVA crew member can perform with the support of the MMU. They are presented here as examples of MMU utility, and to aid in the generation of other task possibilities by potential users.

Figure 3-1 shows a crewmember in a MMU approaching a satellite for inspection. The crewmember might also photograph the satellite, retrieve a material sample, correct a deployment malfunction, stabilize the satellite for retrieval by the Orbiter, or attach a portable RMS grapple fixture to support RMS capture by the Orbiter.

A repair operation being conducted on a beam builder is depicted in Figure 3-2. One crewmember utilizes a reactionless wrench to remove the panel bolts, while the second crewmember photographs the procedure. The first crewmember uses only a waist tether and handhold to maintain position, and has the MMU control arms folded down for access to the work area. The second crewmember is in automatic attitude hold while photographing the repair operation.

In Figure 3-3, a crewmember in a MMU is transporting an experiment tray to the Long Duration Exposure Facility (LDEF) for placement into the structure of the satellite. A second MMU-equipped crewmember waits at the LDEF to assist. The experiment tray may weigh as much as 80 kg (175 lbs) and can be easily transported by the MMU.

Figure 3-4 shows the two crewmembers positioning the tray for placement in the LDEF structure. Such a technique has the advantage of minimizing potential contamination of the experiments or spacecraft from the Orbiter RCS, by maintaining a standoff distance of several hundred yards. The MMU thus allows normal servicing to be accomplished on the LDEF without approach or capture by the Orbiter. In those instances where retrieval of LDEF is required, the MMU can be utilized to stabilize the spacecraft, if necessary, prior to capture by the remote manipulator system (RMS) or after an unsuccessful capture attempt has imparted tumble rates to the LDEF.

Figure 3-5 illustrates a crewmember carrying a film/tape cassette for changeout in a satellite. A simple waist tether is utilized to carry the item. The task of replacing the cassette in the satellite could be easily performed without the use of additional worksite restraints. A more extensive servicing task, such as the replacement of an equipment module in a satellite, would require additional worksite restraints. Figure 3-6 shows a crewmember utilizing a foot restraint to provide support. Some payloads will contain such an integral foot restraint system to facilitate servicing tasks; however, the MMU is capable of transporting such a restraint to the work site for attachment to the satellite structure.

Two crewmembers in MMUs are shown transporting a beam across a structure in Figure 3-7. The crewmembers coordinate their movements by voice communication and can easily position the beam, which is very lightweight, within the structure. For example, the beam shown is 50 meters (150 feet) long and weighs approximately 5 kg (11 lbs). The crewmembers are shown performing a beam alignment task in Figure 3-8. The crewmember at the theodolite is directing cable tension adjustments being made by the second crewmember.

Figure 3-9 and 3-10 illustrate the utility of the MMU for Shuttle rescue in the case where a disabled shuttle vehicle is not stabilized. In such a situation, the MMU is the only practical method of effecting rescue. As the figures illustrate, tangential velocities at the hatch may exceed several feet per second because of the distance from the side hatch of the Orbiter to the vehicle center of gravity. Rescue with the RMS will be difficult because of this velocity and because of the limited reach envelope of the RMS. Rescue with the MMU allows the second Orbiter to stand off at a safe distance while the rescue crewmember maneuvers to achieve the required velocity. A Shuttle rescue operation is shown in Figure 3-11. The crewmember in the MMU carries another crewmember in the rescue sphere. The MMU can also support repair or salvage of an abandoned Orbiter.

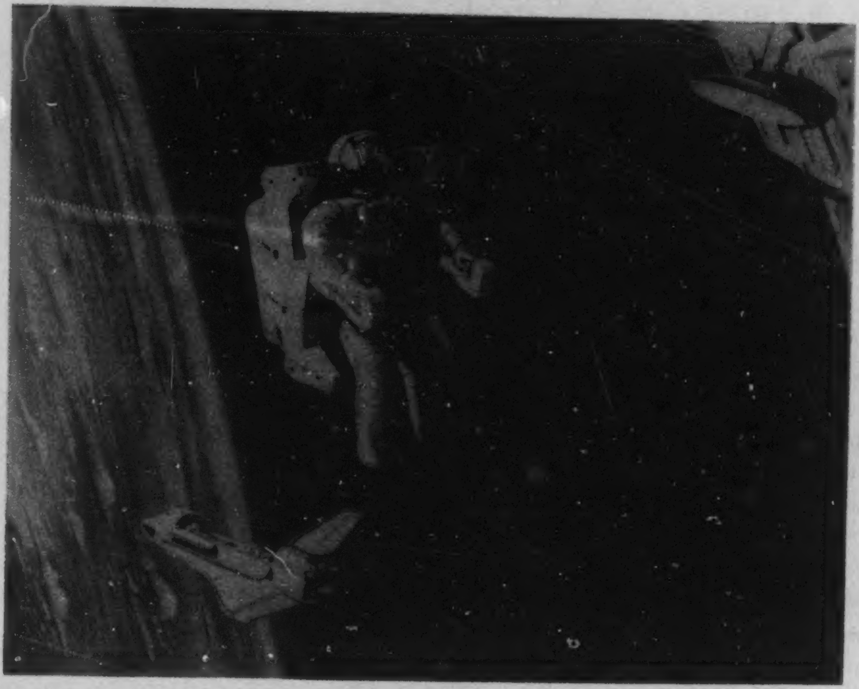


Figure 3-1 Satellite Inspection with MMU

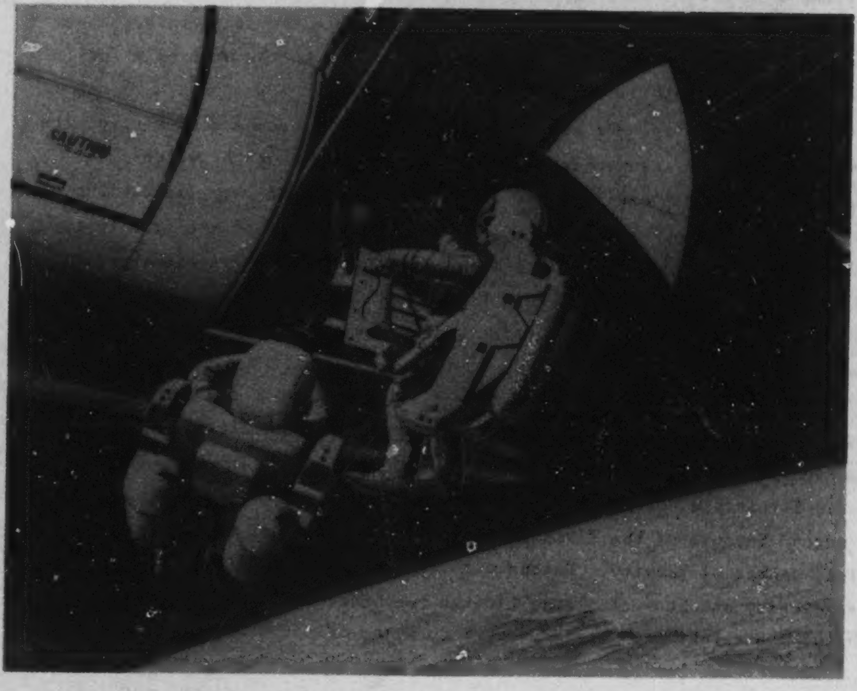


Figure 3-2 Beam Builder Repair

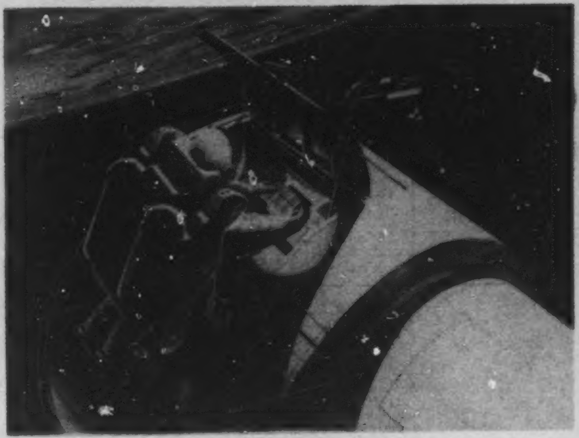


Figure 3-3 Experiment Replacement with MMU

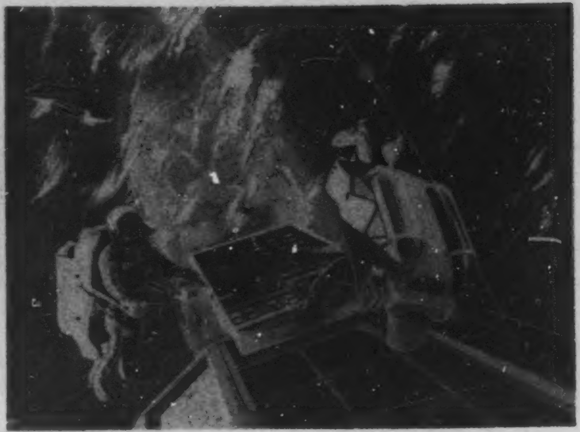


Figure 3-4 LDEF Servicing with MMU

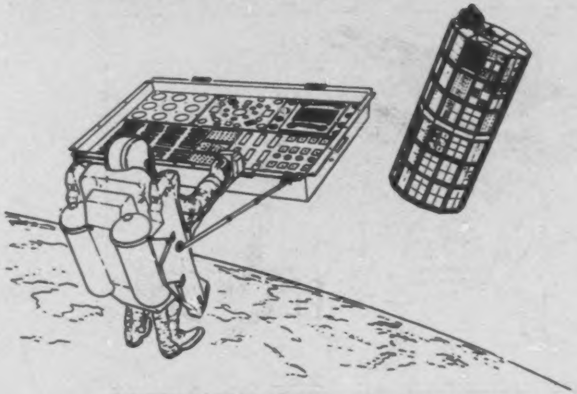


Figure 3-5 MMU Carrying Small Equipment Item

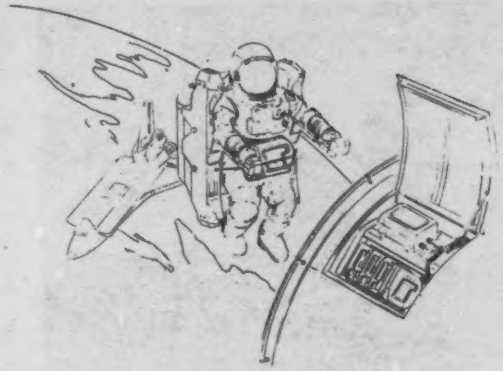


Figure 3-6 Satellite Servicing with MMU

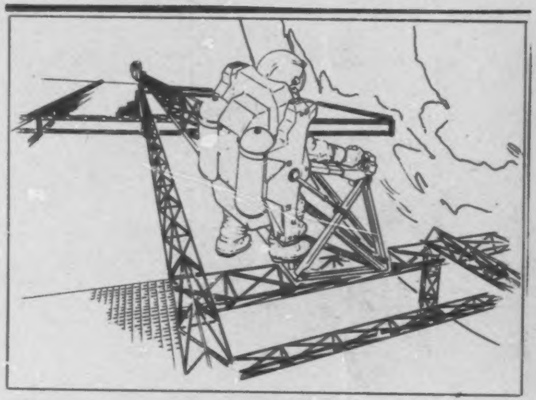
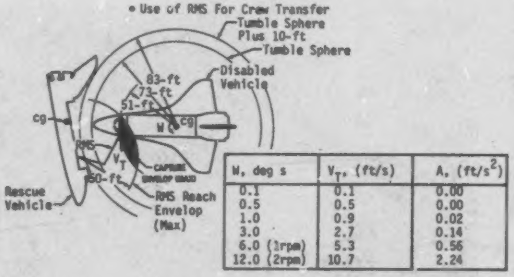


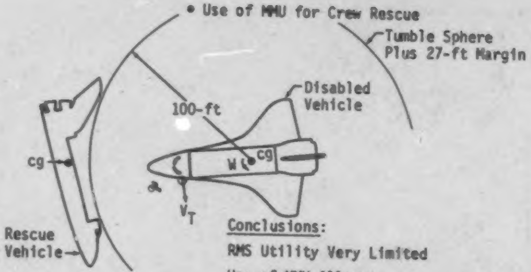
Figure 3-7 MMUs Transporting Beam

Figure 3-8 Structure Alignment Task


• Use of RMS For Crew Transfer
Tumble Sphere Plus 10-ft
Tumble Sphere
Disabled Vehicle
83-ft
73-ft
51-ft
cg
W
cg
RMS
V_T
CAPTURE
50-ft
Rescue Vehicle
RMS Reach Envelop (Max)

W, deg s	V_T, (ft/s)	A, (ft/s^2)
0.1	0.1	0.00
0.5	0.5	0.00
1.0	0.9	0.02
3.0	2.7	0.14
6.0 (1rpm)	5.3	0.56
12.0 (2rpm)	10.7	2.24

Figure 3-9 Rescue from Unstabilized Orbiter with RMS


• Use of MMU for Crew Rescue
Tumble Sphere Plus 27-ft Margin
100-ft
Disabled Vehicle
W
cg
cg
V_T
Rescue Vehicle

Conclusions:

RMS Utility Very Limited

Use of MMU Allows:
- Recovery Up to 3-deg s
- Safer Standoff Distances
- Decreased Thruster Perturbations

Need Two MMUs on Rescue Vehicles

Figure 3-10 Rescue from Unstabilized Orbiter with MMU

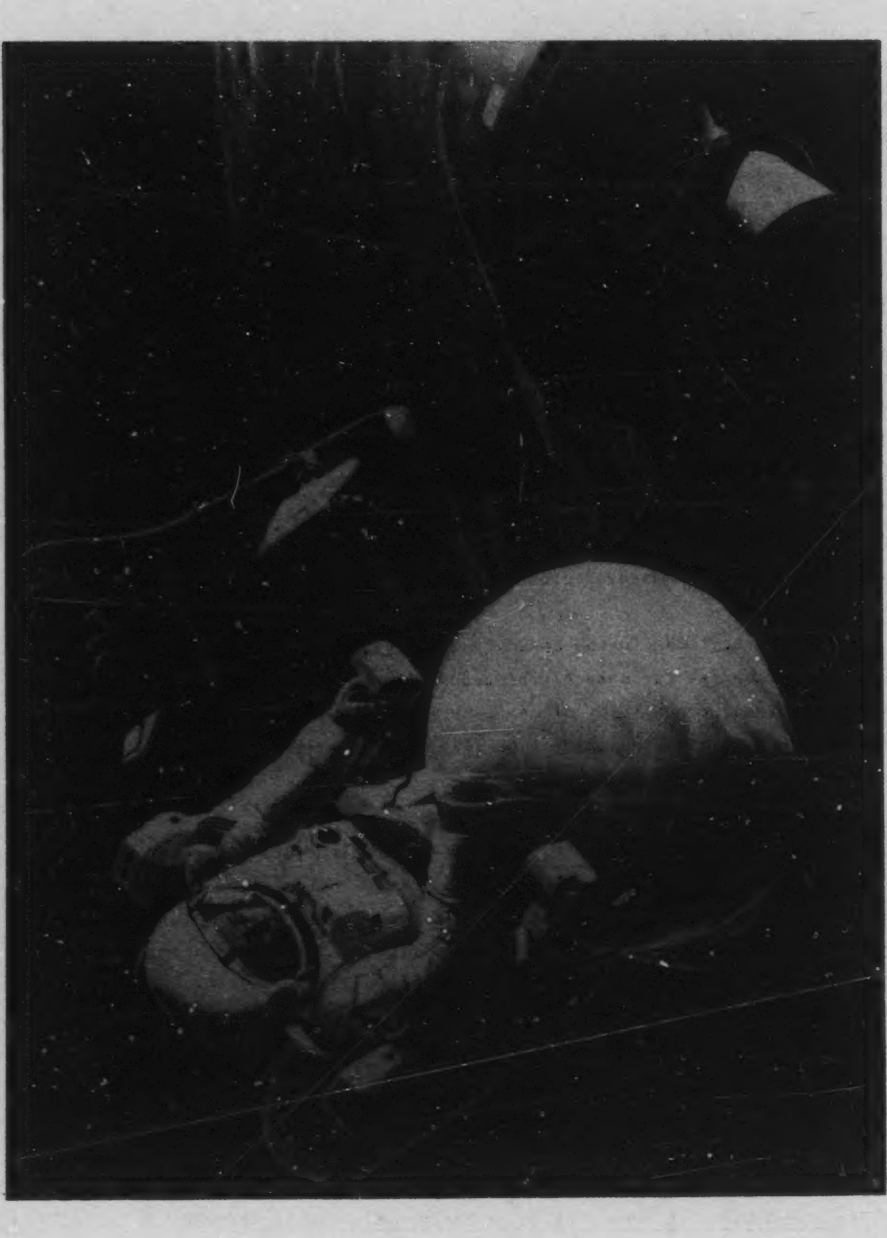


Figure 3-11 Shuttle Rescue with MMU

Small free-flying satellites or experiment packages can be deployed or retrieved by a crewmember in the MMU, as shown in Figure 3-12. This technique can be utilized as a planned operation or as a contingency procedure in the event of failure to achieve deployment/retrieval with the RMS. For low cost payloads or experiment packages the MMU-equipped crewmember could deploy the equipment at a specific distance from the Orbiter, perform activation procedures on the experiment (i.e., extend sensors, remove covers) and return to retrieve the package after sufficient data has been collected. As a contingency deployment/retrieval technique for satellites or experiments, the MMU adds to the probability of complete mission success.

Figure 3-13 depicts several crewmembers stringing support cabling through a large structure. The cable reels are attached to the MMU at the front of the control arms, leaving the crewmember's hands free to operate the hand controllers. Connecting cross member cables is a task which is very difficult to automate, yet one which can be easily accomplished with the aid of the MMU because it can safely maneuver around and within complex structures.

Maneuvering unit use in the assembly of large antennae, as shown in Figure 3-14, can demechanize the assembly procedure, thus reducing program costs and achieving a higher probability of complete mission success. This is especially true in early demonstration flights of erectable structures when operational procedures must be proven.

Figure 3-15 shows MMU support of the space construction automated fabrication experiment. Specific activities could include crew transfer to and from the beam builder assembly, visual inspection and surveillance of beam construction, installation of thermopile detectors and accelerometers, support of dynamic and thermal response experiments, and assistance in demonstrating beam cap and cord repair. In this application, most beam fabrication is performed continuously while being controlled and monitored by the crew inside the Orbiter. EVA is required to perform tasks such as installing subsystems and sensors and connecting electrical cables, where the infrequent occurrence of these activities does not justify the complexity of automated techniques.

3.1 Projected On-Orbit Repair of Solar Maximum Mission Spacecraft

A potential MMU mission being considered by NASA for the early operational phase of the Space Shuttle involves the on-orbit retrieval and repair of the Solar Maximum Mission (SMM) spacecraft. The SMM spacecraft was launched in 1980 on an expendable booster and has since experienced electrical failures in its Attitude Control System (ACS) which make it essentially inoperable. In the proposed mission the MMU would be utilized to stabilize the spacecraft, presently spinning about its longitudinal axis at approximately 1 degree/sec, for retrieval by the Shuttle remote manipulator arm and repair by EVA crewmembers in the cargo bay. The spacecraft would then be redeployed.

Table 3-1 lists the overall mission scenario, and Figure 3-16 shows a crewmember in the MMU attached to the SMM spacecraft to stabilize it using MMU thrusters. The MMU capability of 6 degree of freedom control authority, even with large center of mass offsets, thus significantly increases the ability of the Orbiter to support satellite refurbishment.

Table 3-1 MMU Support of SMM Spacecraft On-Orbit Repair

Scenario

Shuttle Rendezvous with SMM Spacecraft, Stationkeep at Approximately 300 feet

MMU Activities:
- Fly to SMM Spacecraft, Match Rates, Attach (Dock)
- Stabilize SMM
- Attach Second RMS Grapple Fixture
- Establish and Maintain SMM Attitude During Proximity Operations and RMS Grappling
- Release from SMM
- Photograph SMM Spacecraft
- Replace Thermal Barrier for Hard X-ray Burst Spectrometer
- Install Shield Over X-ray Polychrometer Vent
- Return to Shuttle

SMS Module Changeout Performed in PLB by EVA Crewmembers Using Foot Restraints and Hand Holds

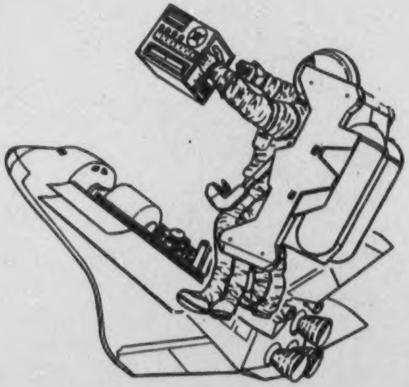


Figure 3-12 Deploy/Retrieve Small Free-Flying Satellite with MMU

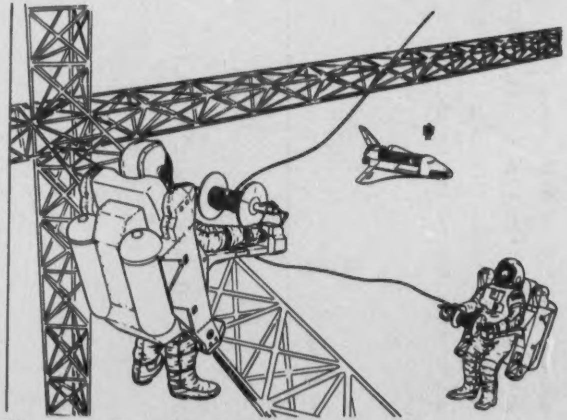


Figure 3-13 Cable Deployment with MMU

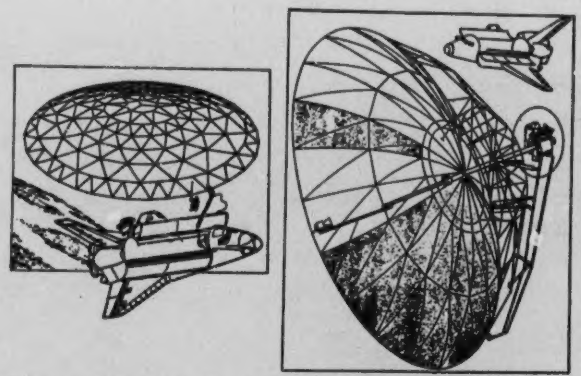


Figure 3-14 MMU Use in Assembly of Large Antennas

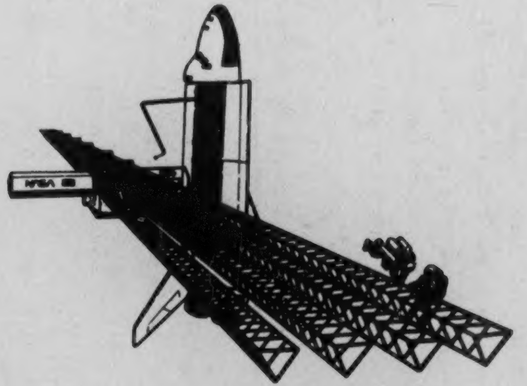


Figure 3-15 Space Construction with MMU

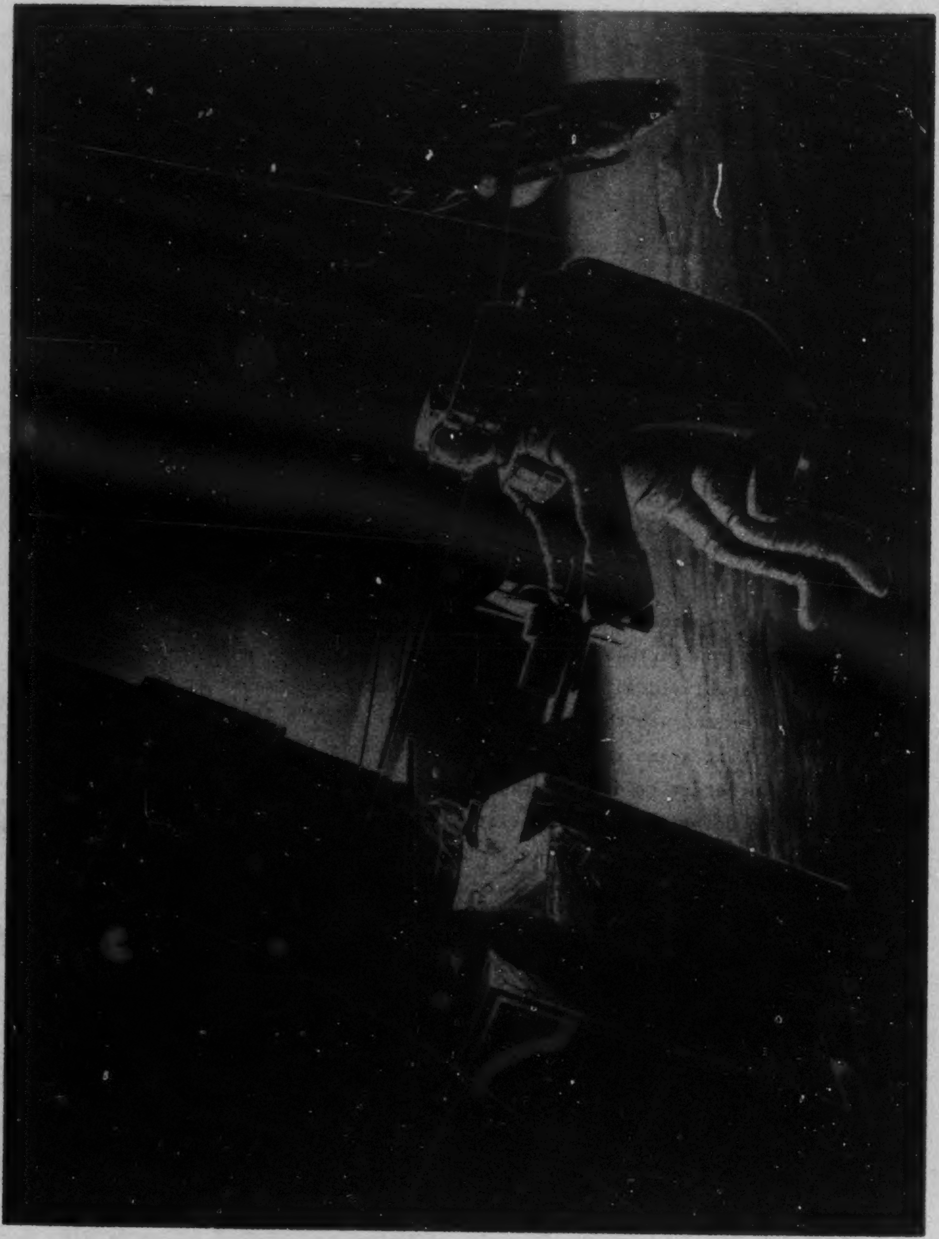


Figure 3-16 MMU Approaching SMM Spacecraft

4.0 MMU/FSS HARDWARE DESCRIPTION

The MMU/FSS system is composed of five major subsystems - Maneuvering Control, Propulsion, Power, Thermal Control, and Structures and Mechanisms. The following sections describe these subsystems in detail. Reference Figure 4-1, MMU and FSS Details.

The MMU and FSS are stowed for launch and reentry on the port side of the forward end of the cargo bay. Figure 4.2 depicts the exact stowage location along with the EVA/Work envelope required for MMU EVA operations. For those Shuttle missions that require the use of two MMUs, the second unit will be stowed on the starboard side of the payload bay, directly opposite the first, and will require a corresponding EVA/Work envelope. EVA reserved envelopes are required to be free of cargo elements prior to beginning extravehicular activity.

4.1 Maneuvering Control

The major components of the MMU Maneuvering Control subsystem are the Rotational and Translational Hand Controllers (RHC, THC), and the Control Electronics Assembly (CEA). The hand controllers are located at the ends of the control arms and are the means by which the pilot's desired translations and attitude changes are input to the CEA. The CEA, in turn, actuates the appropriate thrusters to achieve the maneuver. The MMU coordinate system definition and rotational and translational hand controller command definitions are shown in Figure 4-3. Hand controller commands are either "ON" or "OFF", not displacement or rate proportional. Since the MMU in free space is an inertial system, the effects of any command will remain until an impulse of equal magnitude and opposite direction has been introduced via other commands or external forces. Multiaxis commands in either hand controller are possible.

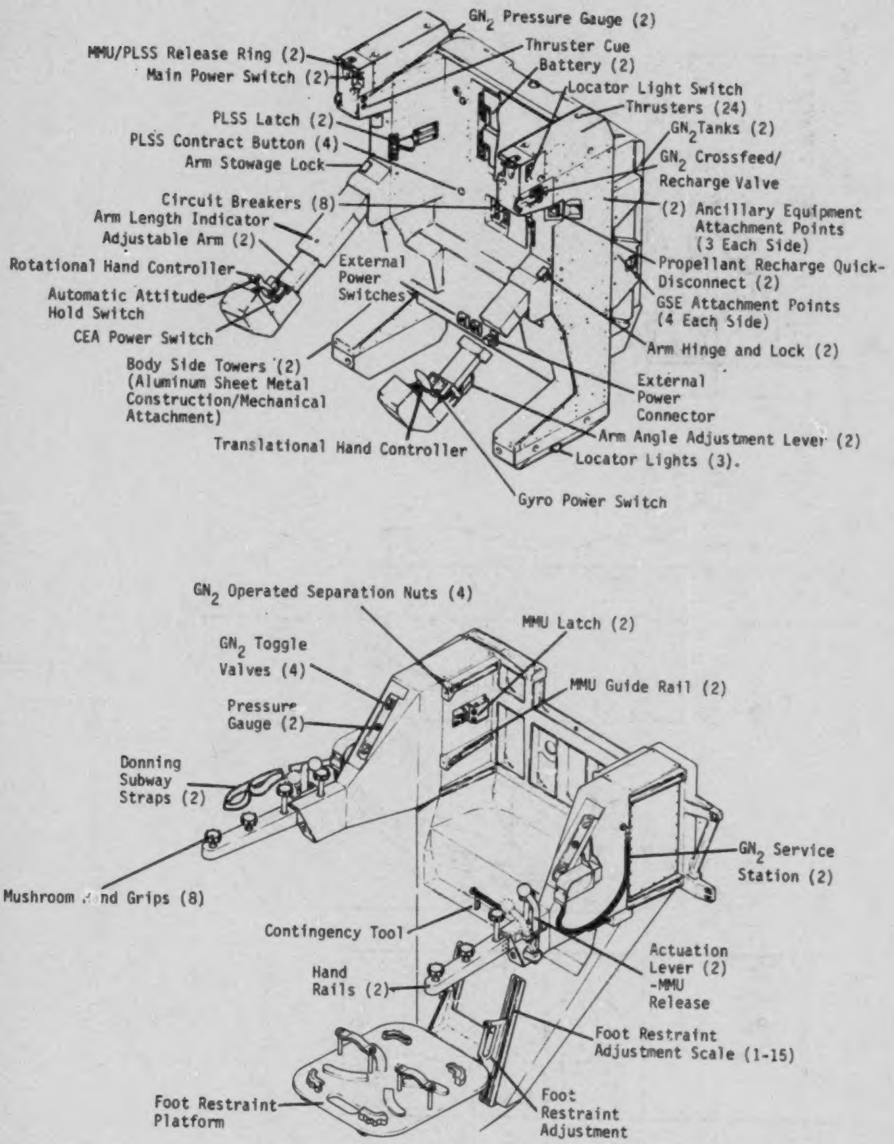
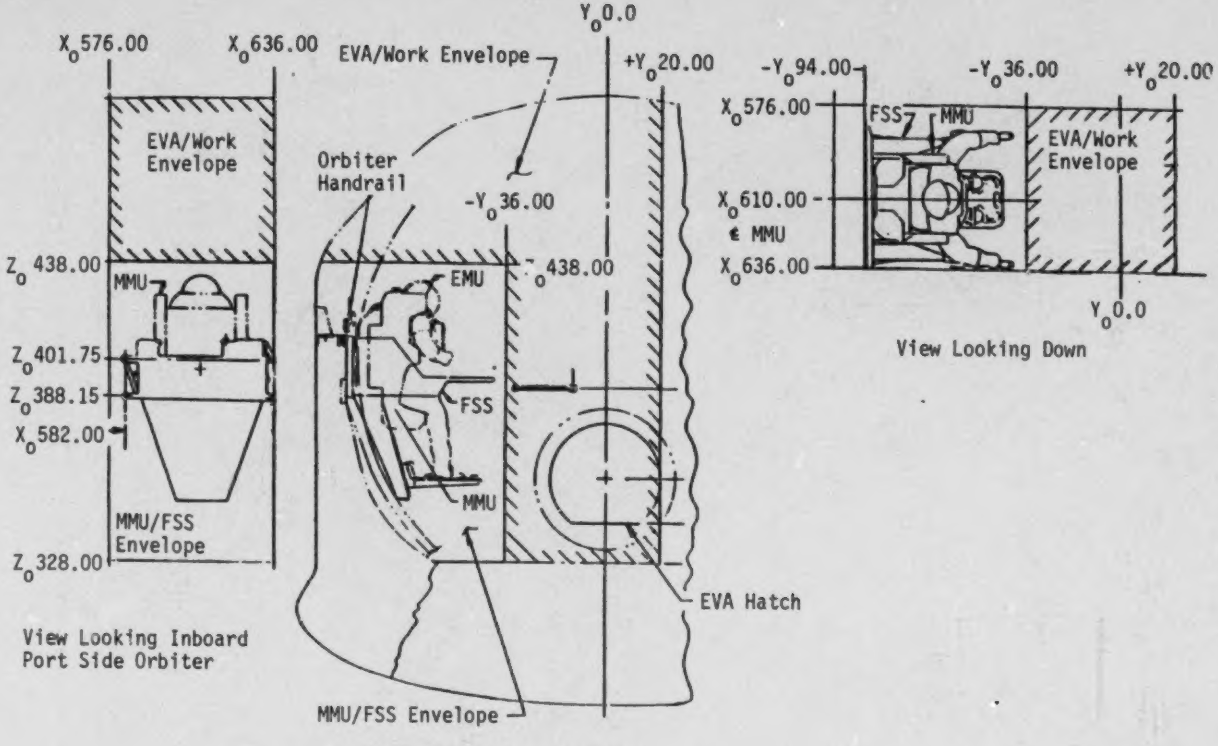

GN$_2$ Pressure Gauge (2)
MMU/PLSS Release Ring (2)
Main Power Switch (2)
Thruster Cue
Battery (2)
Locator Light Switch
Thrusters (24)
PLSS Latch (2)
PLSS Contract Button (4)
GN$_2$ Tanks (2)
Arm Stowage Lock
GN$_2$ Crossfeed/
Recharge Valve
Circuit Breakers (8)
Arm Length Indicator
(2) Ancillary Equipment
Attachment Points
(3 Each Side)
Adjustable Arm (2)
Rotational Hand Controller
External
Power
Switches
Propellant Recharge Quick-
Disconnect (2)
Automatic Attitude
Hold Switch
GSE Attachment Points
(4 Each Side)
CEA Power Switch
Arm Hinge and Lock (2)
Body Side Towers (2)
(Aluminum Sheet Metal
Construction/Mechanical
Attachment)
External
Power
Connector
Arm Angle Adjustment Lever (2)
Translational Hand Controller
Locator Lights (3).
Gyro Power Switch
GN$_2$ Operated Separation Nuts (4)
MMU Latch (2)
GN$_2$ Toggle
Valves (4)
MMU Guide Rail (2)
Pressure
Gauge (2)
Donning
Subway
Straps (2)
GN$_2$ Service
Station (2)
Mushroom Hand Grips (8)
Contingency Tool
Actuation
Lever (2)
-MMU
Release
Hand
Rails (2)
Foot Restraint
Adjustment Scale (1-15)
Foot Restraint
Platform
Foot
Restraint
Adjustment

Figure 4-1 Manned Maneuvering Unit and Flight Support Station Details

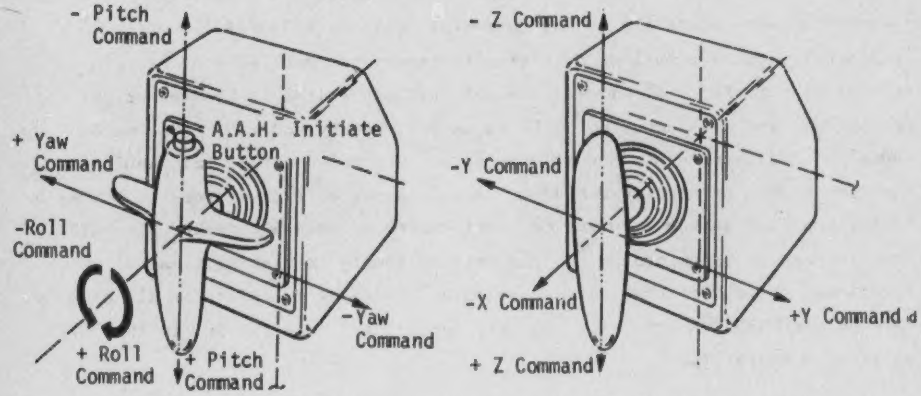

$X_o576.00$
$X_o636.00$
EVA/Work Envelope
$Z_o438.00$
MMU
$Z_o401.75$
$Z_o388.15$
$X_o582.00$
MMU/FSS Envelope
$Z_o328.00$
EVA/Work Envelope
Orbiter Handrail
$Y_o0.0$
$+Y_o20.00$
$-Y_o36.00$
$Z_o438.00$
EMU
FSS
MMU
EVA Hatch
MMU/FSS Envelope
$-Y_o94.00$
$-Y_o36.00$
$+Y_o20.00$
$X_o576.00$
FSS
MMU
EVA/Work Envelope
$X_o610.00$
℄ MMU
$X_o636.00$
$Y_o0.0$

View Looking Inboard
Port Side Orbiter

View Looking Forward

View Looking Down

Figure 4-2 MMU/FSS and EVA Reserved Envelopes


- Pitch Command
A.A.H. Initiate Button
+ Yaw Command
-Roll Command
+ Roll Command
+ Pitch Command
-Yaw Command
- Z Command
-Y Command
-X Command
+Y Command
+ Z Command

MMU Rotational Hand Controller

MMU Translational Hand Controller

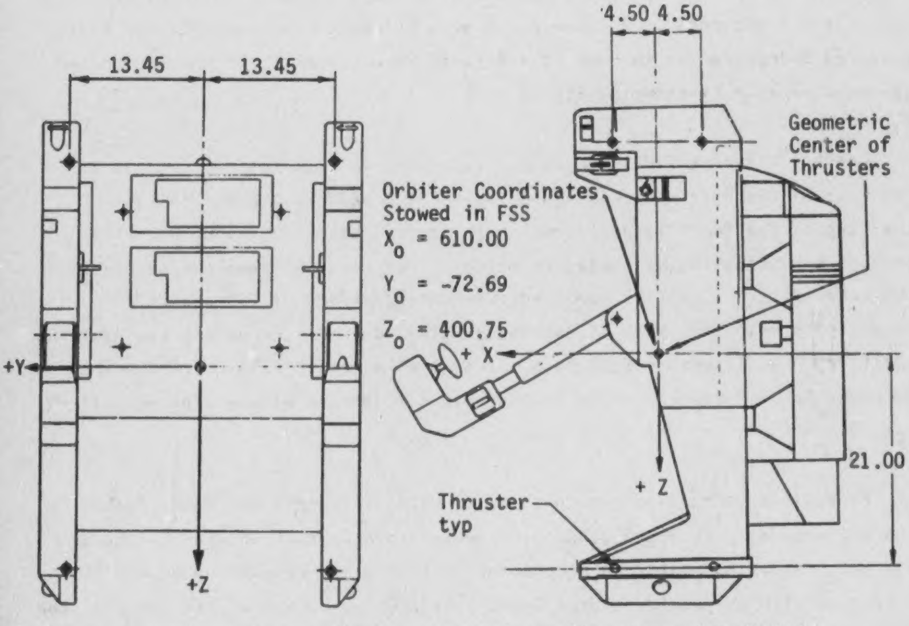

13.45
13.45
+Y
+Z
4.50
4.50
Geometric Center of Thrusters
Orbiter Coordinates Stowed in FSS
X_o = 610.00
Y_o = -72.69
Z_o = 400.75
+ X
+ Z
21.00
Thruster typ

Figure 4-3 MMU Coordinate System and Hand Controller Command Definitions

The CEA contains gyros for sensing rotation rates and uses this information when operating in the Automatic Attitude Hold (AAH) mode to counteract induced rotations by firing thrusters automatically or by modulating thruster "ON" times. The AAH initiate switch is located on the top of the RHC, and when actuated, will cause yaw, pitch, and roll rates to be cancelled and then maintained at near zero. The AAH deadband (allowable rotation before corrective action is taken) is set at 1.25 degrees to act as a filter for limb movement during the performance of worksite tasks. The AAH function can be inhibited in any one axis by simply initiating a manual rotational command in that particular axis, or can be cancelled in all axes by turning the GYRO PWR switch on the left control arm near the THC to the "OFF" position momentarily.

4.2 Propulsion

The MMU propulsion system is comprised of two identical subsystems, each capable of independently providing six-degree-of-freedom maneuverability. Both normally operate in a cooperative mode but have the capability of being operated independently in case of a failure in one side. The MMU propulsion system schematic is shown in Figure 4-4.

Gaseous nitrogen (GN_2) propellant is stored in two pressure vessels at the rear of the unit at pressures of up to 3600 psia at $150^{\circ}F$. Initial charging of the tanks is performed on the ground prior to launch and will provide an available ΔV (Delta Velocity) of at least 66 feet per second at the heavy-limit weight for combined crewmember/EMU/MMU of 755 pounds. (Changes in velocity, both linear and angular, during maneuvering are directly additive). Additional weight such as cargo will result in a corresponding decrease in performance. (See Section 6.0 for details of expected propellant usage).

Propellant recharging on-orbit, if required, is performed while docked to the FSS according to the procedure in Section 5.4 of this document. The MMU and FSS recharging system is a redundant hardware set consisting of the FSS interface with the Orbiter, propulsion line routing to and within the FSS, the FSS external flex line/Quick Disconnect and stowage assembly, and the MMU propellant recharge Quick Disconnect. The FSS flex line/Quick Disconnect can be seen by referring to Figure 4-1. Only one of the redundant hardware sets need be used for recharging of both MMU tanks, since a crossfeed provision exists for making a direct connection between the two propellant tanks.

The crossfeed valves, CRSFD A and CRSFD B, are located on the body side towers above the MMU Recharge Quick Disconnects. During normal flight the valves are closed to keep the two propulsion systems isolated. CEA thruster control logic assures that propellant usage from each tank is approximately equal when the MMU is operated in the prime mode.

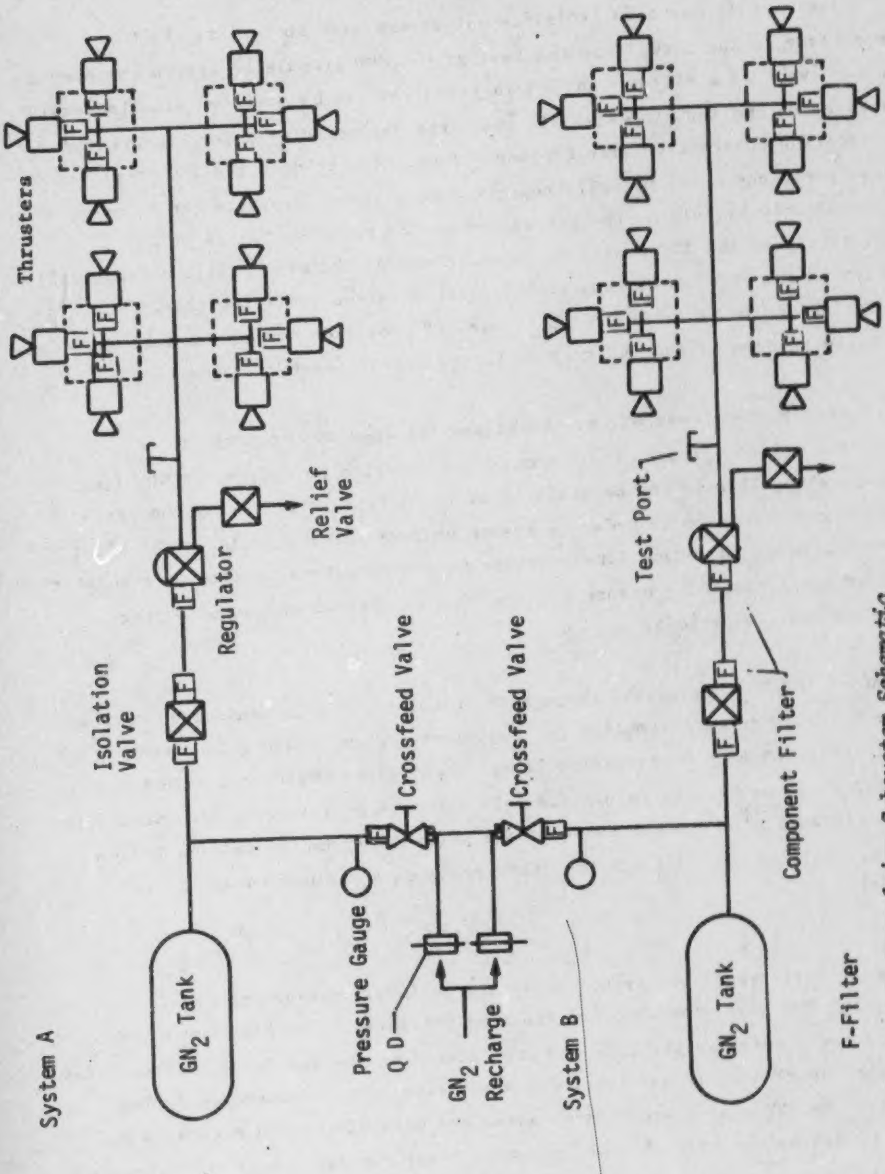

System A
GN_2 Tank
Isolation Valve
Regulator
Relief Valve
Thrusters
Pressure Gauge
Q D
Crossfeed Valve
Crossfeed Valve
GN_2 Recharge
System B
GN_2 Tank
Test Port
Component Filter
F
F-Filter

Figure 4-4 Propulsion Subsystem Schematic

Electrically operated isolation valves are used to isolate the GN_2 propellant in the tanks from the rest of the MMU propulsion system components in the event of a malfunction. Both isovalves can be operated simultaneously by rotating the THC clockwise 36° about the X-command axis for closure, or by rotating counterclockwise to open. A detent will hold the THC in either of these positions until manually repositioned. Either isovalve can be operated independently by holding the corresponding CEA power switch (A or B) momentarily in the ISO position. When released, the switch will automatically return to the "OFF" position, with isolation valves remaining closed. Switching CEA PWR A or CEA PWR B to the "ON" position causes the corresponding isovalve to open if the THC grip is in the normal (vertical) position.

Directly downstream of the isolvalves are located the pressure regulator/relief valves. These components function to reduce the GN_2 line pressures to 212 psia and maintain it at a constant level during the period of tank depressurization in order to assure uniform thrust levels. The relief valve functions to reduce line pressure to the thrusters in case of regulator failure or in case of pressure build-up due to thermal expansion during thruster non-use periods.

After the GN_2 has passed through the regulator, it is manifolded to four three-thruster triad assemblies per redundant system. Each triad assembly is fed by only one A or B propulsion line. Same system traids are arranged on the MMU so as to be able to provide full six-degree-of-freedom maneuverability in the absence of the other system. See Figure 4-5, MMU Propulsion System layout. Each of the 24 total thrusters produces a nominal thrust of 1.7 pounds.

Additional propulsion system equipment includes pressure gauges for monitoring MMU tank pressures and FSS line pressures. The MMU guages are lighted for viewing in the dark and are located on the inside of the body side towers at approximately eye level for monitoring of tank pressures during flight. The FSS guages are located above the base of the FSS handrails and serve to define the available GN_2 pressure level for use during the recharge sequence.

Four gas actuated separation nuts are used to secure the MMU to the FSS during the high stress period encountered during Shuttle launch and ascent. The nuts are released on-orbit by cycling the FSS SPLY and VENT valves located next to the pressure gauges during MMU pre-flight checkout in the payload bay. Verification of positive launch-lock release is provided by green bolt heads which become visible after popping clear of the disengaged nuts.

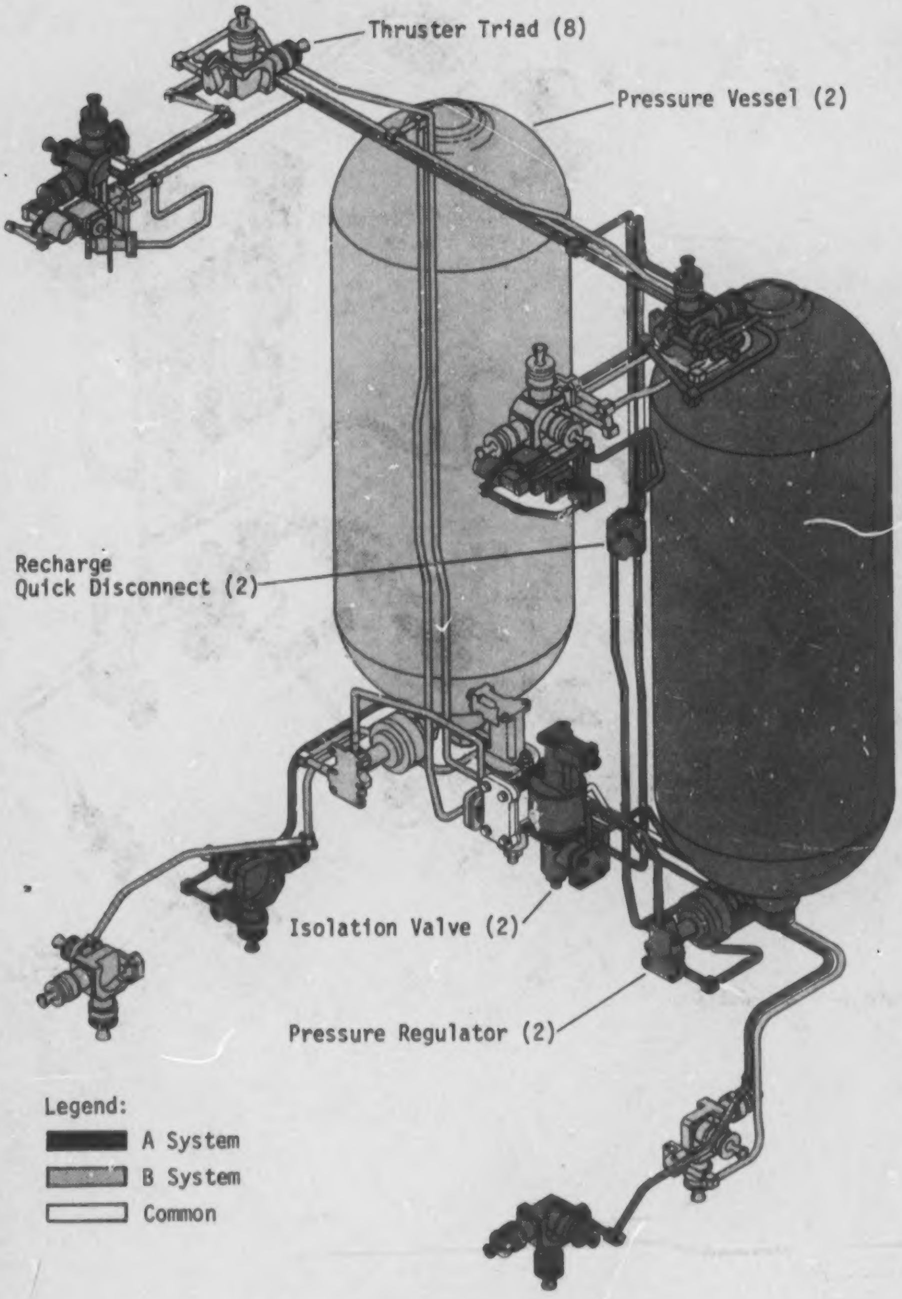

Thruster Triad (8)
Pressure Vessel (2)
Recharge Quick Disconnect (2)
Isolation Valve (2)
Pressure Regulator (2)
Legend:
■ A System
▨ B System
☐ Common

Figure 4-5 MMU Propulsion System Layout

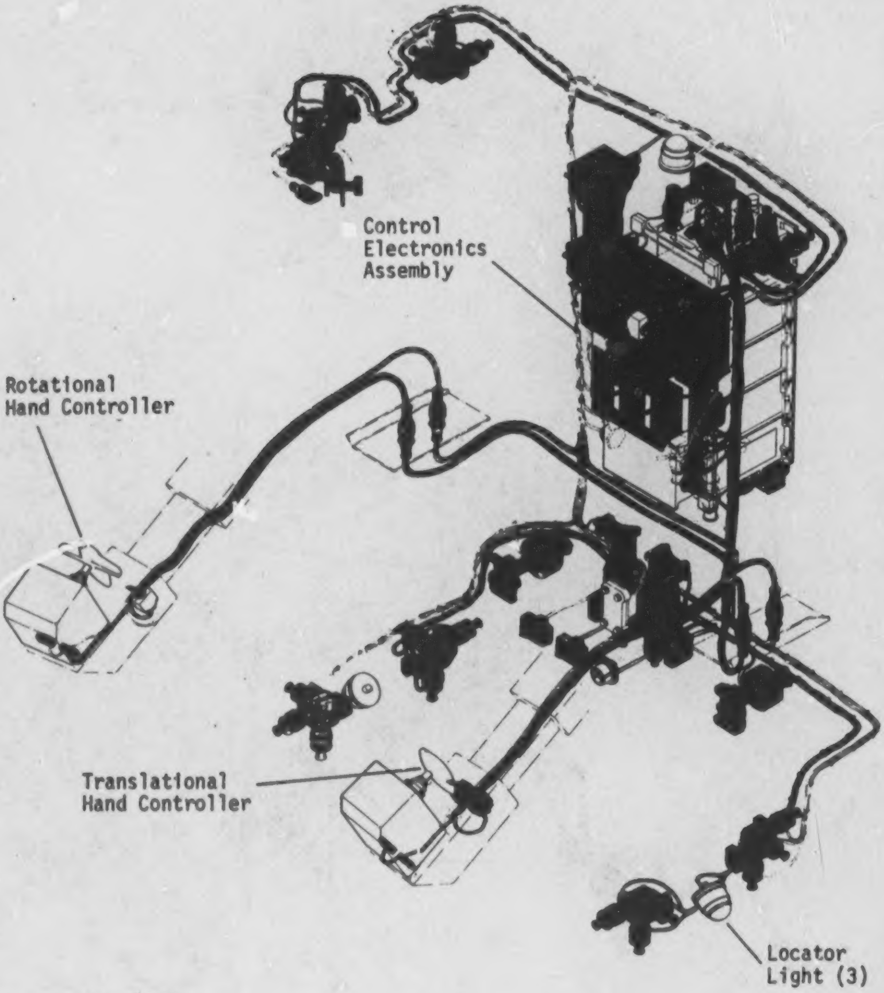

Control
Electronics
Assembly
Rotational
Hand Controller
Translational
Hand Controller
Locator
Light (3)

Figure 4-6 MMU Cabling

4.3 Power

The MMU Power System consists of two 16.8 volt silver zinc batteries and a power distribution system that includes circuit breakers, switches, and relays. Components which are critical for mission success are arranged into two independent and identical system sets. See MMU Cabling Diagram, Figure 4-6.

The batteries are installed in the MMU for launch and will supply a total of 752 watt-hours of power between recharges, more than enough for a six hour EVA at expected usage levels. The MMU and PLSS (Primary Life Support System) batteries are interchangeable on-orbit. Spares are carried in the orbiter mid-deck. Each of the two MMU batteries is equipped with a tether ring to aid on-orbit replacement. A latch pin is located on the left side of each battery when facing the MMU from the FSS foot restraints. The latch is operated by pushing upwards on the top lever with the index finger and then rocking the lower lever downward with the thumb. This is a one-handed operation. Followng the unlatching, the battery swings out from the left, is removed and transported by a tether hooked to the ring. The reverse procedure is followed to replace the battery.

During non-use periods the FSS draws needed power for heating of MMU and FSS components from the Orbiter through the FSS power distribution system. The FSS electrical interface with the MMU is through an FSS umbilical to the MMU external power connector, located at the base of the unit between the body side towers. A and B INT/EXT power switches are provided. Prior to leaving the FSS, battery power is applied to the MMU by turning external power switches A and B to "INT", removing the FSS receptacle from the MMU external power connector, and activating the main power switches A and B located on the upper body side towers.

Power is applied to the Control Electronics Assembly by activating the CEA PWR A and CEA PWR B switches on the right control arm near the RHC. Nominal operation requires that both switches by "ON" in order for both sides of the control and propulsion subsystems to be operable.

The CEA rate gyros are activated by a seperate GYRO PWR switch on the left control arm near the THC. Independant CEA and gyro power switches allow the automatic attitude hold function to be turned off/on witout interfering with manual thruster commands.

CEA thruster command signals are monitored and amplified to power Thruster Cue Lights located at eye level on the inside of the body side towers. The cue lights are red LED's and are used to provide visual indication of thruster operation in the absence of other audio or visual feedback. One light is provided for system A and one for system B.

A locator light system consisting of a strobe converter and three white locator lights is used to provide visual indication of the position of the EVA astronaut to an observing crewmember. The lights flash simultaneously once every two seconds and are located on the outside of each of the lower MMU towers and on the top horzontal surface between the two towers. They can be powered by either battery by proper positioning of the locator light switch on the upper left body side tower.

Circuit breakers provide overcurrent protection on all power input circuits. A total of eight breakers, four for each of the A and B systems are located on the vertical surface between the MMU towers and below the batteries, for easy access during power-up/power-down operations in the PLB. The circuit breaker status can be examined and/or altered prior to or after EVA.

4.4 Thermal Control

The Thermal Control System (TCS) maintains the MMU and FSS structures and components temperatures within their acceptable ranges through all mission phases. The TCS is a cold-biased design utilizing thermal coatings, multilayer insulation, thermal isolators, component heat, thermostats, and heaters for temperature control. There are no thermal constraints imposed on the MMU orientation during EVA outside of the Orbiter payload bay when the EVA begins with MMU/FSS temperatures within the nominal stowage limits. However, EVA inside the payload bay is time constrained during payload bay to sun orientatons. During orbital cold environmental storage, the MMU and FSS component temperatures are maintained above minimum allowable limits using Orbiter power. The MMU heater systems are powered through the MMU external power connector by the FSS cable which is removed from the MMU prior to free flight. Thermostats in the FSS arms control the storage heater systems to provide component over-temperature protection. Hot environment storage temperatures are passively maintained below limit by the MMU/FSS external surface coatings (mostly white paint).

Prior to MMU free flight operations, it may be necessary to condition the MMU component temperatures to acceptable operating ranges by re-orienting the Orbiter for a period of up to six hours. Seven temperature sensors located on the MMU and FSS provide the crew with readouts in the Orbiter cabin to determine pre-EVA temperatures and heater system status. In addition, caution and warning alarms are provided to warn the crew of TCS contingency operations in time to take corrective actions.

4.5 Structures and Mechanisms

4.5.1 MMU

The basic MMU structure consists of two side towers connected by a center structure, and two control arms. Construction is mainly aluminum and is of a semi-monocoque lattice with a truss framework to absorb stresses and a skin to act as a shear web. The structure is designed to allow the unit to withstand an impact of one foot per second without degradation of performance, and two feet per second while still remaining operable.

The two body side towers support the thruster triads and provide for the MMU/FSS retention latches. The center structure supports the two batteries, the CEA, the two pressure vessels and propulsion equipment, and the retention system for the EMU.

The MMU and EMU (or PLSS) are held together during flight by means of two latches mounted on the inside of each MMU tower which engage receptacles on the PLSS. The PLSS is locked into place automatically when the astronaut backs into the MMU. Doffing the MMU is accomplished by pulling the MMU/PLSS release rings located at the top front of the body side towers. Two independent latching mechanisms enable the MMU to be doffed easily even in case of one latch mechanism failure. A lap belt serves as a redundant method of securing the crewmember to the Maneuvering Unit. The belt is attached to the MMU just above the control arms on both sides.

The MMU control arms are designed to be used in one of three positions:

Launch - in which the arms are fully folded back and locked against the MMU body.

Work - in which the arms are positioned at 82° below horizontal for easy access to work site areas.

Flight - in which the arms are positioned at 30° below horizontal for comfortable operation of hand controllers during flight.

The arms can be released from the launch position and moved into the work position by releasing the stowage latches at the control arm shoulders. This will cause the arms to spring into the work position automatically. The reverse operation, repositioning the arm to the launch position from the work position, requires that the stowage latch be released while exerting a small force on the arm to push it back against the MMU body. When the arms are in the worksite position, they can be pulled up and will lock into the flight position automatically. When the arms are in the flight position and are to be rotated back into the work position, it is necessary to depress the arm angle adjustment levers on the underside of the arms to release them from their "flight-locked" position.

The control arms' lengths are adjustable over a five inch range in one-half inch increments in order to accommodate crewmembers ranging in size from fifth-percentile females to ninety-fifth percentile males. The arms are extended or retracted by engaging the arm length adjustment levers on the side of each arm and exerting a force on the arm in the proper direction. By reading the indicators through the apertures in the top of each arm, the arms can be easily adjusted to the correct length. The arm extension mechanisms will not function unless the arms are locked into the flight position, and the arms must be retracted to their minimum length before they can be rotated out of the flight position.

4.5.2 FSS

The Flight Support Station is attached to the Orbiter on the port side of the foward end of the Payload Bay. The FSS Structure houses all the necessary hardware for storage and servicing of the MMU.

The MMU is secured to the FSS by means of latches on each side of the FSS. The latches are operated by two levers located on the outside of each FSS arm. The levers are designed to function in three positions.

To free the MMU from the FSS, the levers are depressed (to unlock) and then pulled back toward the crewmember into the "Release" position. After FSS egress, the levers automatically spring into the "Capture" position to prepare for FSS ingress. In this position the latches are spring loaded to capture and hold the MMU loosely in place until the levers are pushed forward by the crewmember into the "Lock" position to secure the MMU for reentry. In case of failure, the latches may be manually disengaged by pulling an attached lanyard which breaks a shear pin in the latch. The MMU can then only be secured for re-entry by reinstalling the two launch bolts on the side of the disengaged latch using the contingency tool located on the FSS shelf near the external power connector cable.

Donning "subway" straps are located on each side of the FSS structure to assist the crewmember in docking the MMU to the FSS upon returning from an EVA mission and when donning the MMU prior to flight. Also, four mushroom-shaped handgrips are provided on each of the FSS handrails to assist the crewmember during ingress and egress maneuvers.

An adjustable foot restraint located at the base of the FSS provides the EVA crewmember with a stable platform for perfrming necessary servicing functions on the MMU and also serves to assist in the MMU ingress and egress operations from the FSS. A single set of toe pieces and two sets of heel clips allow the EMU boots to be inserted with the crewmember facing either toward or away from the FSS. The platform is adjustable over a fourteen inch range in one inch increments in order to accommodate crewmember variations in stature. The adjustment mechanism consists of a quick release pip pin on the left support member and a release trigger and adjustment scale on the right member. In order to adjust the platform height, the pip pin is first released and then the release trigger is squeezed. While squeezing the trigger the crewmember raises or lowers the foot restraint platform to the desired position. When the trigger is released, the trigger pin is inserted into the hole and then the crewmember reinserts the pip pin into the corresponding hole.

5.0 OPERATING SEQUENCE

The sequence of tasks which the crewmember must perform to operate the MMU in orbit are described in this section. Four phases of activity are significant to MMU utilization on-orbit:

1. Preparing the MMU for flight;
2. Actual orbital operations (i.e., maneuvering) to perform specific EVA tasks;
3. Stowing the MMU in the cargo bay for re-entry; and,
4. Performing on-orbit electrical and propulsion system servicing.

5.1 Preparation for Flight

MMU EVA operations begin when the EMU equipped crewmember attaches himself to the payload bay safety tether and egresses from the airlock at the forward end of the payload bay. After translating via handholds to the MMU Flight Support Station, he ingresses the foot restraints facing the MMU and performs an initial visual checkout of the unit. Battery changeout and/or propulsion system recharging may be accomplished at this time, if necessary. (Reference Section 5.4). After reconfiguring the MMU from stowage to operating mode, the crewmember turns around to back into and don the unit. Once the MMU Status has been reverified, the crewmember stows the safety tether, releases the MMU from the FSS, and after a short check-out flight in the payload bay, is ready to begin orbital operations.

5.2 Orbital Operations

Procedures for utilizing the MMU are highly mission dependent and will be defined in terms of specific maneuvers and actions to be accomplished. A mission sequence of events will serve as the basis for performing individual maneuvers, but these maneuvers will be accomplished according to the crewmembers judgement. See reference 3 for the Orbiter TPS Repair Mission Sequence of Events. The EVA crewmember must utilize visual cues alone to judge relative velocity and distance during maneuvering; the only interface between the astronaut and the Orbiter vehicle during EVA is the r.f. voice communicatons link.

5.3 MMU Doffing and Stowage for Reentry

When the MMU mission is completed, the crewmember returns to the payload bay, maneuvers to a position facing the FSS, and engages the Foot Restraint. The crewmember then executes a 180° turn and re-ingresses the restraint. Alternatively, he may fly into a "heads down" position over the FSS, grasp the mushroom knobs, and walk through the back of the FSS to arrive at the same position. He then backs the MMU into the FSS and locks it in place. The payload bay safety tether is then reattached before releasing the PLSS latches to free the EMU. Propulsion system recharging will be performed at this time if subsequent MMU EVA operations are expected.

5.4 Servicing

Both the electrical and the propulsion subsystems may require on-orbit servicing. In general, servicing can be performed either before or after the EVA, depending on the status of consumables remaining in the PLSS.

5.4.1 Electrical

On-orbit electrical servicing of the MMU involves battery replacement and/or recharging. The MMU will be launched with two batteries installed and spare batteries and a battery transfer bag stowed in the Orbiter crew compartment. The batteries are normally replaced at the beginning of the second EVA.

The crewmember will egress the airlock with two fresh batteries in the battery bag. The used batteries in the MMU will be transferred tc the battery bag and replaced with fresh ones. The used batteries in the transfer bag are stowed on the FSS until the end of the EVA, when they will be transferred to the Orbiter airlock. The airlock has provisions for recharging the batteries.

5.4.2 Propulsion

Propulsion system recharging is normally performed at the end of an EVA, when subsequent MMU missions are expected. Charging is performed by the EVA crewmember facing the MMU in the FSS foot restraints. Redundant systems are provided on the FSS to transfer the pressurized GN_2 from the Orbiter RCS tanks to the MMU. One recharge station with its associated hardware is located on each side of the FSS. Either or both of the stations may be used. Repressurization of the MMU tanks is accomplished by attaching an FSS flexline/QD to the MMU recharge fitting and opening the appropriate MMU and FSS toggle valves. The tanks will require about 90 seconds to fill. Approximately 5 minutes is required to perform the entire recharge sequence.

5.5 Malfunctions/Contingency Procedures

The MMU and FSS systems, subsystems, and components are designed to preclude conditions dangerous to the crewmember in any operational mode. All mechanisms and subsystems are fail operational/fail safe so that no single credible failure can prevent the safe return of the crewmember to the Orbiter.

In the event of an MMU or FSS failure, backup modes or contingency procedures will be implemented ranging from operation of a single switch to using tools to disassemble a mechanism. In general, the MMU design allows rapid response to single failures with minimum interruption in control authority. Malfunctions in FSS mechanisms are treated using tools.

6.0 CONSUMABLES PARAMETRICS

The rates at which MMU propellant and electrical power are consumed are dependent not only upon mission unique factors such as total system mass, but also upon the manner in which the crewmember accomplishes the required maneuvers. Propellant consumption is especially sensitive to maximum velocities and coast times. This section presents propellant and power consumption parametrics which should enable potential users to estimate their utilization for specific applications.

6.1 Propellant Consumption Parametrics

Mission dependent factors which affect MMU propellant usage are system mass (crewmember mass including the EMU, plus propellant mass remaining), cargo mass, applied torques, center of mass offsets and changing propellant I_{sp}. Crewmember dependent factors include maximum coast velocities achieved, post attitude maneuver errors, use of attitude hold, and pilot aiming errors (resulting in overshoot/overspeed). Table 6-1 shows the minimum and maximum crewmember/EMU/MMU system weights and the corresponding MMU response characteristics. Figure 6-1 shows MMU total equivalent delta velocity (ΔV) in translations as a function of initial system weight. Delta velocity for any maneuver is twice the coast velocity achieved (i.e., propellant is used for acceleration and braking) and is additive for all such maneuvers during a mission. Propellant utilized for rotational maneuvers is normally presented as equivalent ΔV and should be included in the total capability.

In terms of total impulse available, the MMU capability is 1593 lb-sec. Figure 6-2 shows the impulse required to achieve a particular ΔV as a function of system weight, and Figure 6-3 gives the same informaton for rotational rates and system inertia.

For application in which the MMU is utilized to transport, reorient or stabilize large cargo masses, MMU equivalent ΔV capability is correspondingly lower, as shown in Figure 6-4. It should be remembered however, that ΔV requirements in such cases are usually small (i.e., 2-5 feet per second), and that the ΔV capability increases again for those maneuvers performed without the cargo attached. Table 6-2 gives examples of the impulse required to achieve certain rotational rates with large cargoes.

Maneuvering unit performance overheads depend on crewmember flying techniques and have been investigated with six degree of freedom simulations. The data produced indicate that a cumulative factor of 1.4 can be applied as a conservative estimate for any series of maneuvers beyond a simple translation. Thus, for a mission in which it is calculated that 25 fps ΔV is required, performance overheads would bring the total requirement to 35 fps.

6.2 Power Consumption Parametrics

Maneuvering unit power consumption during an EVA ranges between 46 and 137 watts, depending upon system configuration. Average power consumption over a typical 6 hour EVA is between 75 and 100 watts. Table 6-3 shows power consumption for each MMU subsystem. The energy available from the two MMU batteries is 752 watts-hrs, which provides adequate margin for any anticipated mission. Of course battery changeout or recharge between EVA's would provide full capability for subsequent EVA's, if required.

Table 6-1 System Weight Limits

Spec Light Limit		Spec Heavy Limit	
	lb		lb
5% Female	103	95% Male	215
Spec EMU (10# H_2O Used)	199	EMU (CEI Spec)	210
Spec MMU (17# GN_2 Used)	313	MMU	330
Total	615	Total	755
Nominal Thrust	= 1.70#	Nominal Thrust	= 1.70#
Acceleration	= 0.356 FPS^2	Acceleration	= 0.290 FPS
Delta Velocity*	= 81.7 FPS^2	Delta Velocity*	= 66.3 FPS
Pitch Acceleration	= 9.7 DPS^2	Pitch Acceleration	= 6.8 DPS^2
Yaw Acceleration	= 10.4 DPS^2	Yaw Acceleration	= 7.9 DPS^2
Roll Acceleration	= 9.7 DPS^2	Roll Acceleration	= 7.1 DPS^2
* Specific Impulse = 66 s			

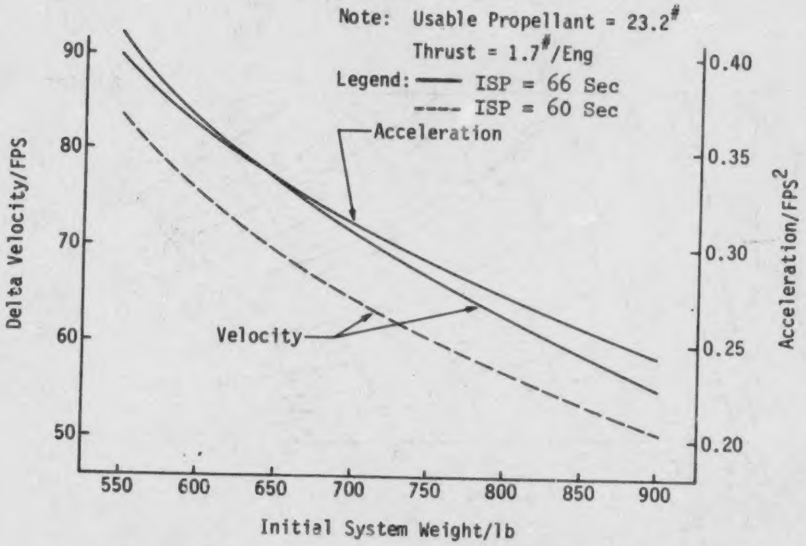


Figure 6-1 MMU Velocity and Acceleration Capabilities

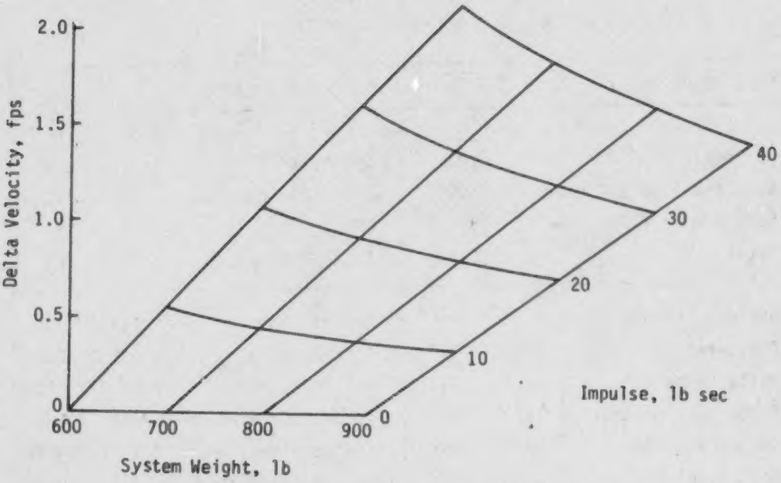
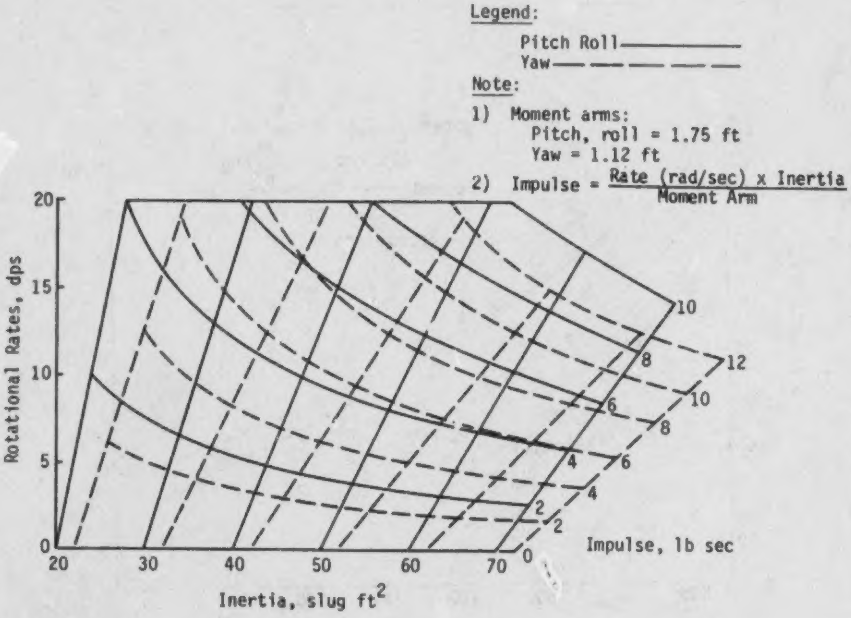


Figure 6-2 Translational Impulse Requirements



Note:

1) Moment arms:
Pitch, roll = 1.75 ft
Yaw = 1.12 ft

2) Impulse = $\frac{\text{Rate (rad/sec)} \times \text{Inertia}}{\text{Moment Arm}}$

Figure 6-3 Rotational Impulse Requirements

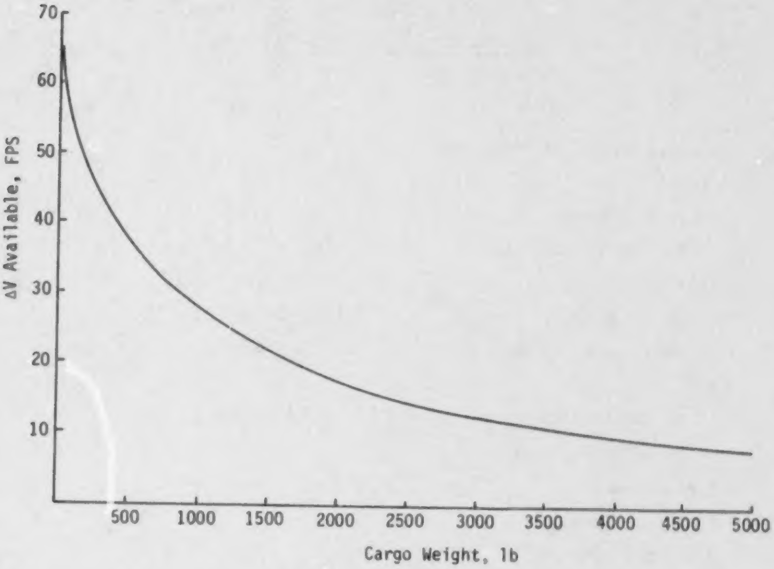


Figure 6-4 MMU Delta V Capabilities for Large Cargoes

Table 6-2
Rotational Maneuvers with Large Cargoes

Rate (deg/s)	Inertia (slug ft^2)	Moment Arm (ft)	Required Impulse (lb-sec)
5	1,000	5	17.4
5	5,000	5	87.2
5	10,000	5	174.4
5	1,000	10	8.7
5	5,000	10	43.6
5	10,000	10	87.2
5	1,000	20	4.4
5	5,000	20	21.8
5	10,000	20	43.5
1	1,000	5	3.5
1	5,000	5	17.5
1	10,000	5	35.1
1	1,000	10	1.8
1	5,000	10	8.8
1	10,000	10	17.5
1	1,000	20	0.9
1	5,000	20	4.5
1	10,000	20	9.0

$$\text{Impulse} = \frac{\text{Rate (rad/s)} \times \text{Inertia}}{\text{Moment Arm}}$$

TABLE 6-3

POWER BUDGET, A OR B BATTERY

1. CEA:	Watts	Watts(1)
a) Non-redundant DC Power Supply		
+15V		
To AC Supply	0.12	
To Control Circuits	1.18	
-15V		
To AC Supply	0.09	
To Control Circuits	1.18	
+5V		
To Control Circuits	0.026	
Efficiency, 68%		3.82
Input Power	2.60	
b) AC Power Supply		
26V RMS, 3200 Hz	3.0 Avg.	
26V, RMS 800 Hz	12.2 Max.	
	10.7 Avg.	
	15.2 Max.	
	13.7 Avg.	
Efficiency, 50%		30.4 Max.
Input Power		27.4 Avg.
Total for Automatic Hold		34.2 Max.
		31.2 Avg.
c) Redundant DC Power Supply		
+5V		
To Control Circuits (includes thruster cue light plus heat for hand controller handles)	2.85	
Efficiency, 40%		7.13
Input Power		
d) VDA's to Valves		
Assumes Average		3.58
2. Locator Lights:		
Maximum		15 Max.
Average		3 Avg.
3. Heaters, at 16.8 VDC		
Propulsion	17.25	
Hand Controllers	3.0	
Locator Light Control	3.0	
Gauge Light/Circuit Breaker Heaters	1.6	
CEA	44.0	
	69.25	69.25

TABLE 6-3 (Continued)

	Watts	Watts
4. Power Relay	2.5	
Gyro Relay	2.5	
	5.0	5.0
Totals		137.2 Max.
		120.7 Avg. 1
		73.7 Avg. 2
		46.3 Min.

(1) Includes efficiency factors.

NOTES:

1) Maximum power occurs when all heaters are on, gyro motors are spinning up, and locator lights are on. This neglects the peak power drawn by thrusters which, for one valve at 70°F and 15 volts, is about 24 watts. Peak power duration ranges from a minimum of about 4 milliseconds to several seconds.

2) Avg. 1 power occurs when gyro motors are up to speed and includes the average locator light power.

3) Avg. 2 power, 47 watts less than Avg. 1, occurs when thermostatically controlled CEA heaters and strobe converter heaters are off.

4) Minimum power, 27 watts less than Avg. 2, occurs when gyro power is off.

7.0 ANCILLARY EQUIPMENT

7.1 Attachment Device

On-orbit support activities utilizing the MMU may sometimes require a temporary rigid interface between the crewmember/MMU and the satellite, structure, or payload. For example, stabilization of a tumbling satellite may require that the MMU be mechanically attached to the satellite, either at the Remote Manipulator Arm grapple fixture or at a trunnion fitting, to allow efficient transfer of counteracting thrust provided by the MMU. A standard MMU to payload attach device is under development by NASA to provide this capability. The device (see Figure 7-1) will be mounted to the MMU between the control arms and, when activated by the crewmember in the MMU, would provide a mechanical interface between the MMU and the payload. The crewmember would also manually release the device to maneuver away from the payload. The attachment device interfaces with the MMU via mounting pins located on the inboard surfaces near the end of each control arm. The device would be fixed to the MMU by the crewmember after the MMU is donned and removed prior to doffing.

7.2 Ancillary Package Attachment

Provisions have been made for the attachment of ancillary equipment such as electronic packages, tool carriers, photo lights, and cameras to the external surfaces of the MMU and FSS. Attach points and envelopes are shown in Figure 7-2. The MMU and FSS ancillary package envelopes are partially coincident and therefore "same-side" envelopes may not both be used on the same Shuttle mission. FSS ancillary package envelope dimensions may also be subject to payload bay 90 inch radius envelope restrictions, depending on mission requirements.

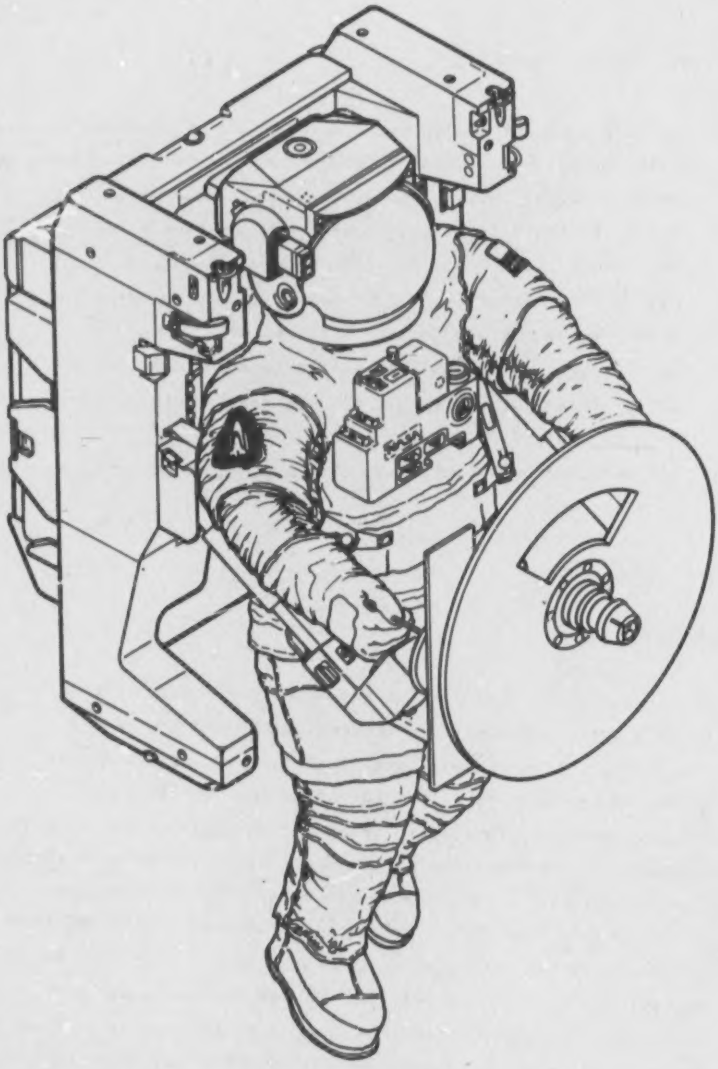
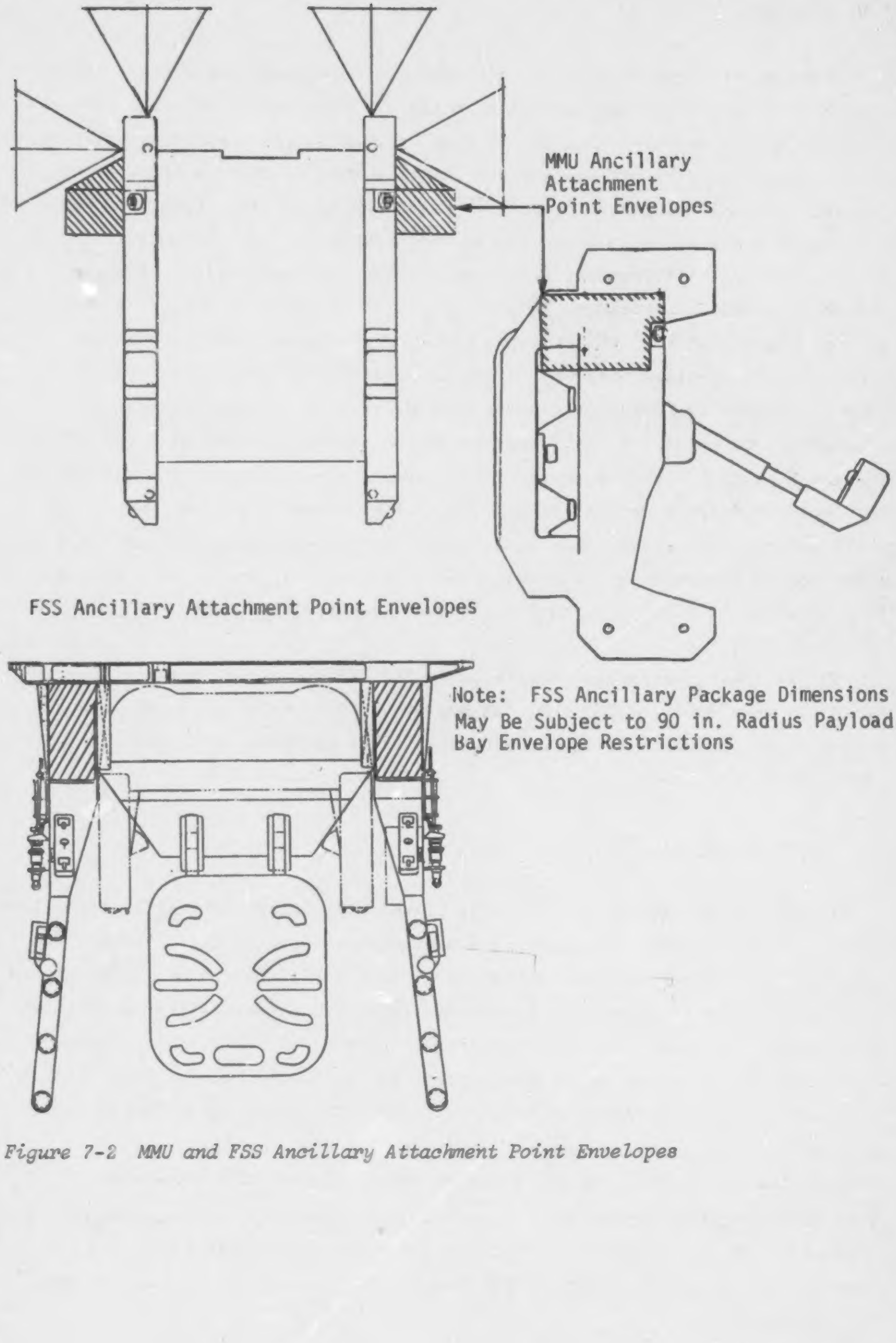


Figure 7-1 MMU with Satellite Attachment Device


MMU Ancillary
Attachment
Point Envelopes
FSS Ancillary Attachment Point Envelopes

Note: FSS Ancillary Package Dimensions May Be Subject to 90 in. Radius Payload Bay Envelope Restrictions

Figure 7-2 MMU and FSS Ancillary Attachment Point Envelopes

8.0 TRAINING SUPPORT

Three major types of training are employed to prepare crewmembers to fly the MMU and to perform specific mission tasks. The Space Operations Simulator (SOS) at Martin Marietta, Denver, is used to familiarize crewmembers with the flying characteristics of the MMU and to train them to respond properly to possible MMU malfunctions. The SOS is also used in the development of and training for mission unique procedures and techniques. The Weightless Environment Training Facility (WETF) at the Johnson Space Center, Houston, is utilized to train crewmembers in the procedures required to don, doff and service the MMU in the Orbiter cargo bay, and in the part task procedures peculiar to a specific mission. Training sessions and demonstrations in a normal one-gravity (1-g) environment provide additional opportunities for crewmembers to handle, operate and become thoroughly familiar with the MMU and payload hardware. Other techniques such as air bearing simulations and KC-135 zero gravity flights can be utilized in special cases. However, due to the short duration (45 seconds per parbola) of KC-135 weightless maneuvers and the superimposed random accelerations, such flights are not useful in training that involves "flying" the MMU using its own control authority.

The following paragraphs describe the SOS, WETF, and ONE-G facilities which are available for MMU training support. These facilities and techniques have been extensively utilized during MMU flight hardware development, fabrication, and test.

8.1 Space Operations Simulator (SOS)

The Martin Marietta SOS is a large travel, six degree-of-freedom simulator which is used for MMU crew training and procedures development. The SOS was used for similar purposes for Skylab Experiment M509. The pilot is positioned in a platform at the head of a gimbal carriage and may wear either a Shuttle EMU, properly pressurized, or conventional "shirtsleeves" attire. Computer controlled servo motors drive the platform in translation along three sets of rails and in rotation about three gimbal axes. The pilot controls his motion with MMU hand controllers on the gimbal platform that provide inputs to a digital computer. The computer contains the simulated mass properties, equations of motion, coordinate transformations, and MMU control electronics model so that it can process the inputs and drive the gimbal platform to simulate zero-g flight. Figure 8-1 depicts the interaction between the SOS system elements.

Table 8-1 shows the SOS capabilities and carriage characteristics.

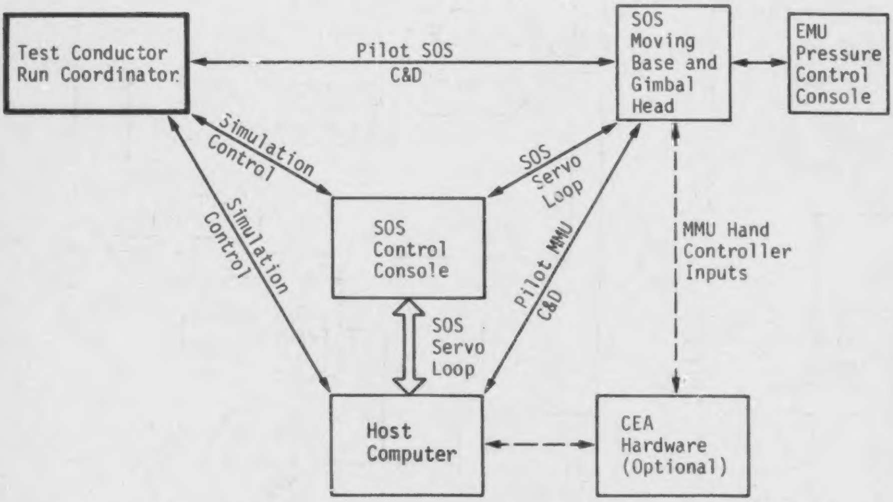
Full-scale partial mockups of the Orbiter nose and underbody as well as the forward section of the cargo bay are also located in the SOS facility. The MMU trainer can be flown under either simulated daylight or nighttime conditions.

The MMU components and flight environment are modeled in a dynamic simulation to provide a high-fidelity representation of the zero-g flying characteristics of the unit. The simulation software reads pilot inputs from the MMU hand controllers, models the MMU systems affected, and then calculates the responses necessary to appropriately drive the gimal carriage.

All MMU simulation software resides in a Prime 750 computer and Chromatics intelligent terminals. The Prime software is written in Fortran except for some utility and interface routines that are written in Assembly language. The Chromatics terminals are programmed in Basic and are primarily used for test personnel display, inputting simulated MMU malfunctions, and initial condition selection. Figure 8-2 shows the SOS computer interfaces, and Figures 8-3 and 8-4 show the simulator in use.

8.2 Weightless Environment Training Facility

The weightless environment training facility (WETF) at NASA-JSC is a large (30 ft. x 100 ft. x 25 ft. deep) neutral buoyancy tank utilized for procedures development and part task training for Space Shuttle missions. MMU donning/doffing, FSS ingress/egress and servicing procedures are practiced in this facility. Mission unique tasks, such as work site procedures can also be developed. Figures 8-5 and 8-6 show examples of MMU training conducted in the WETF. High fidelity MMU/FSS trainers are available for use, as are mockups of the Orbiter cargo bay and airlock.



Test Conductor Run Coordinator
Pilot SOS C&D
SOS Moving Base and Gimbal Head
EMU Pressure Control Console
Simulation Control
SOS Servo Loop
Simulation Control
SOS Control Console
Pilot MMU C&D
MMU Hand Controller Inputs
SOS Servo Loop
Host Computer
CEA Hardware (Optional)

Figure 8-1 SOS Systems Configuration for MMU Simulations

Table 8-1 SOS Capabilities

- Six (6) Degree-of-Freedom Motion to Realistically Simulate MMU Zero-g Flight
- Partial High Fidelity Mockup of the MMU to Accept Pilot's Control Inputs and Provide Pilot Displays
- Full Scale Mockups of Partial Orbiter Sections
- Simulation of MMU Malfunctions During Free Flight
- Carriage Travel:

Carriage Travel:	Pitch	+ 60 deg - 80 deg	15 deg/s
	Roll	±170 deg	30 deg/s
	Yaw	±170 deg	35 deg/s
	X	66 Feet	2.4 ft/s
	Y	12 Feet	1.5 ft/s
	Z	12 Feet	1.3 ft/s
	Reorientation	±90 deg (Manual Only)	

8.3 One-Gravity Training Hardware

High fidelity mockups and trainers of the MMU and FSS are utilized for demonstrations and training of crewmembers. Support facilities for pressure suited operations exist at both JSC and Martin Marietta, Denver. One-g training allows crewmembers to become familiar with the details of the hardware and, since training time is not normally constrained in such an environment, particular attention can be focused on contingency procedures and mission-unique operations. Figure 8-7 shows a one-g MMU/FSS evaluation conducted at Denver.

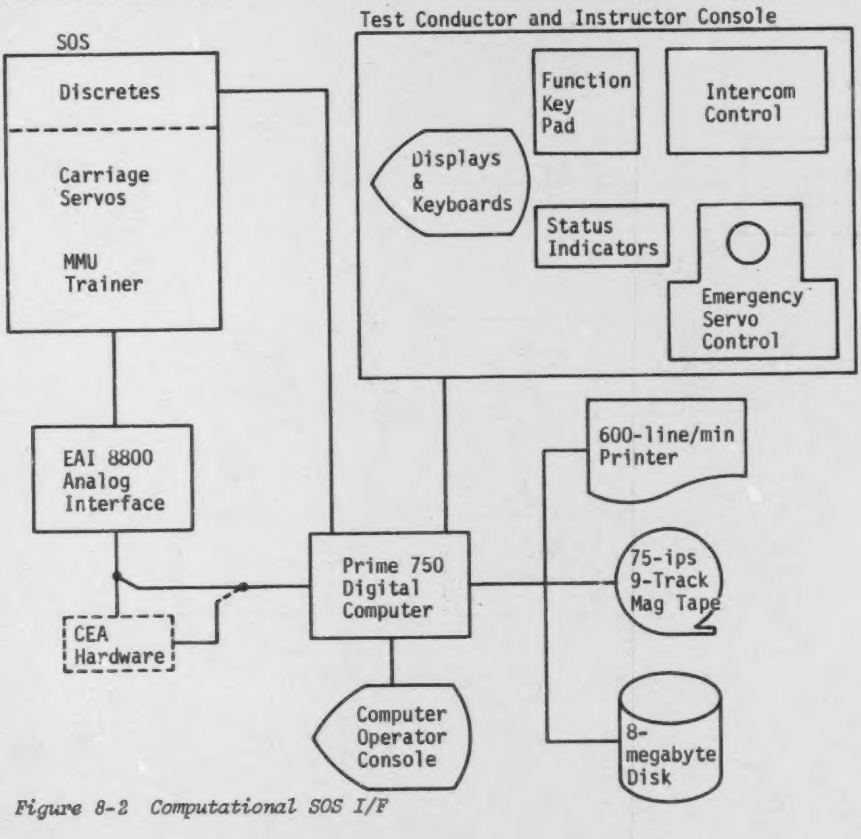

Test Conductor and Instructor Console
SOS
Discretes
Carriage Servos
MMU Trainer
Function Key Pad
Intercom Control
Displays & Keyboards
Status Indicators
Emergency Servo Control
600-line/min Printer
EAI 8800 Analog Interface
Prime 750 Digital Computer
75-ips 9-Track Mag Tape
CEA Hardware
Computer Operator Console
8-megabyte Disk

Figure 8-2 Computational SOS I/F

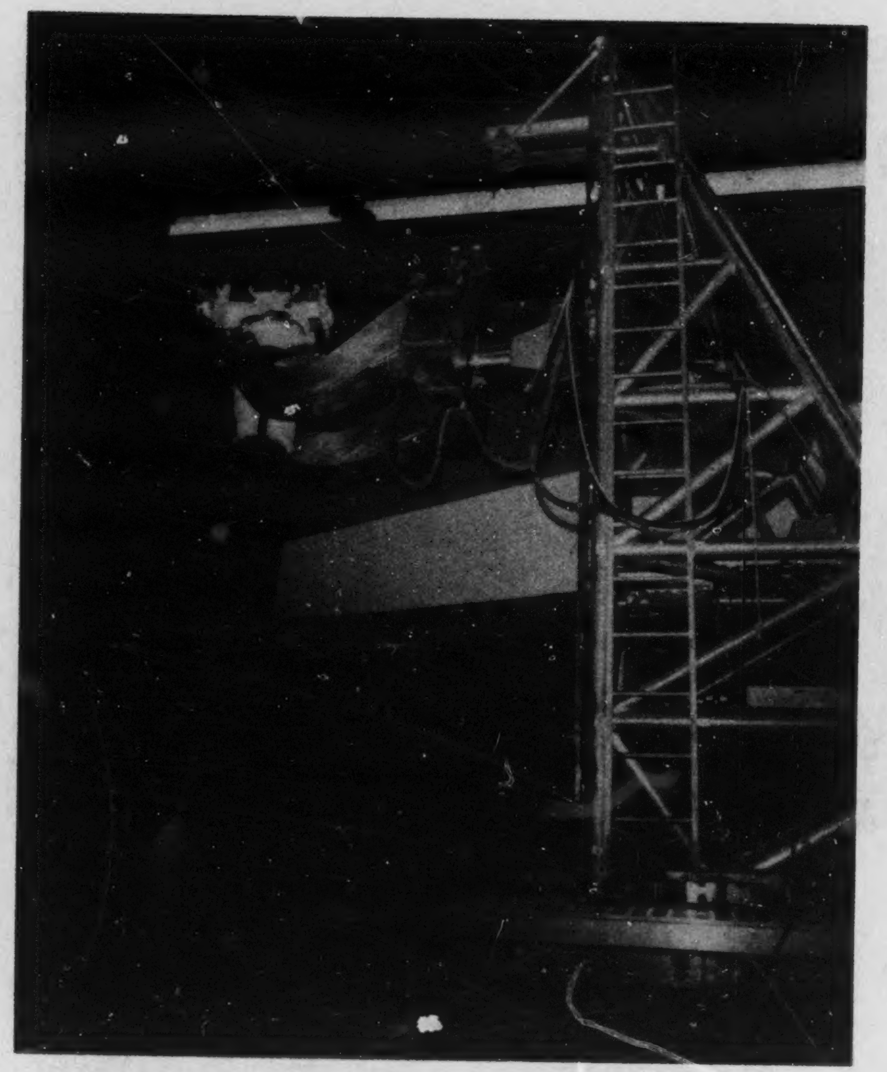


Figure 8-3 SOS Gimbal Carriage

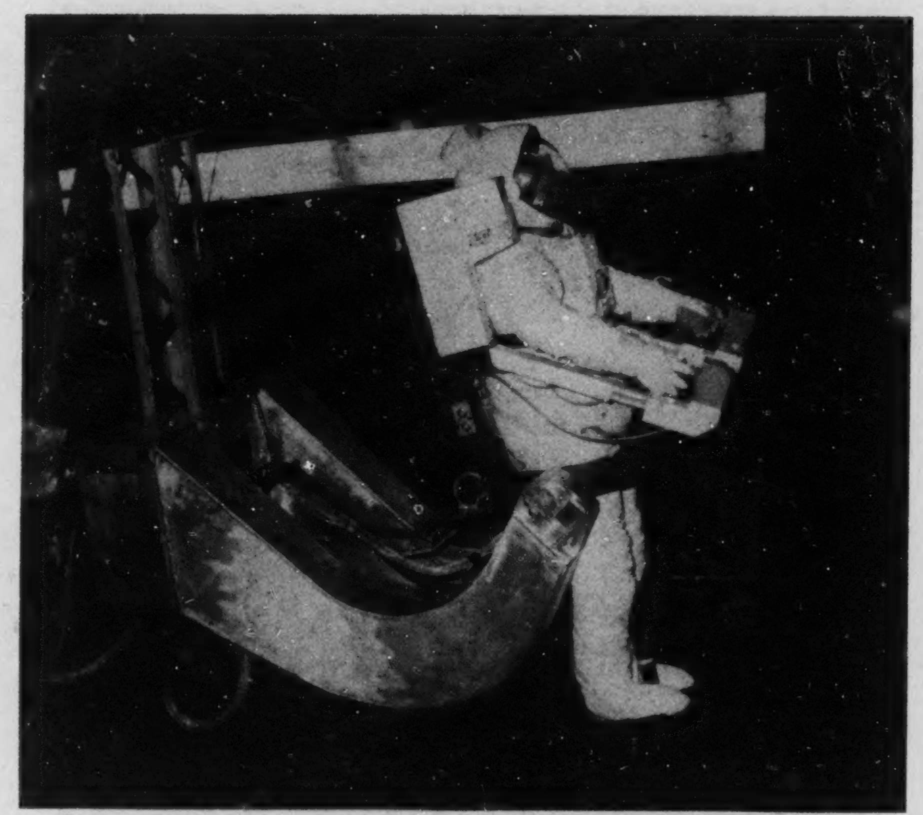


Figure 8-4 Six Degree-of-Freedom MMU Simulator

Figure 8-5 WETF Evaluation of MMU On-Orbit Servicing

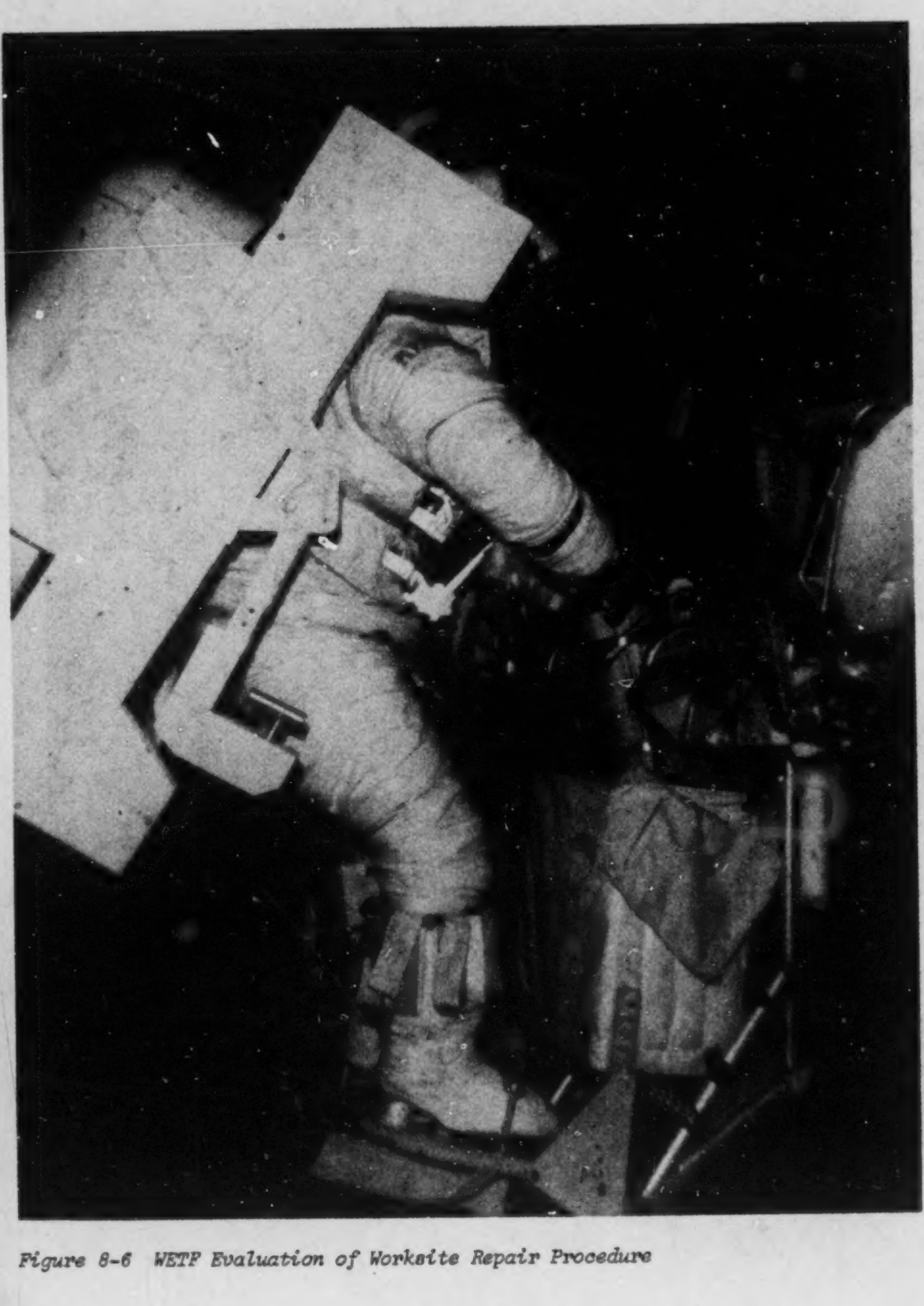


Figure 8-6 WETF Evaluation of Worksite Repair Procedure

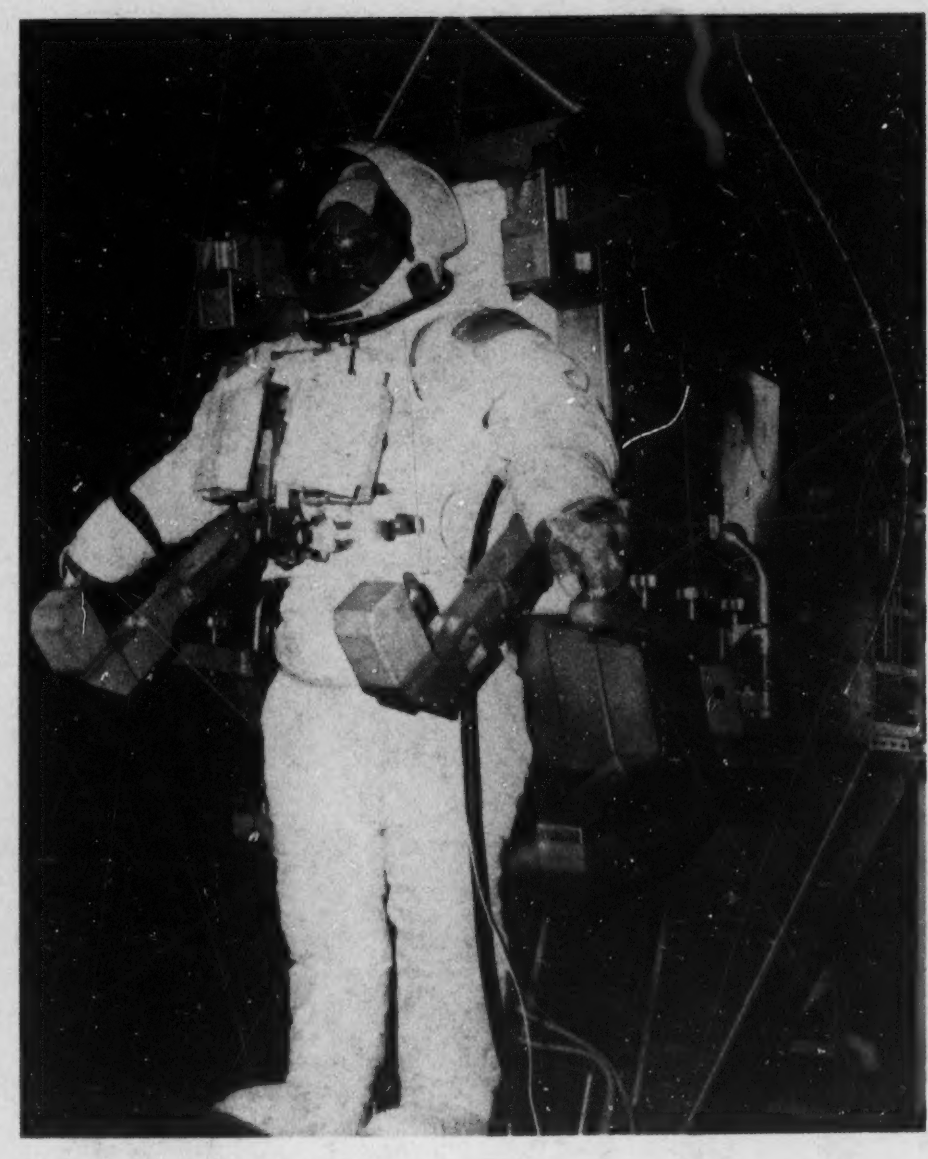


Figure 8-7 MMU/FSS One-g Evaluation

9.0 REFERENCE DOCUMENTS

Ref. No.	Document No.	Title	Source
1	N/A	Skylab Experiment M509 Astronaut Maneuvering Equipment Orbital Test Results and Future Applications	Advances in the Astronautical Sciences, Vol. 31, Part 2, pp 385-416, American Astronautical Society, Tarzana, CA
2	JSC-10615	Shuttle EVA Description and Design Criteria	NASA/JSC
3	MMU-SE-17-08	Manned Maneuvering Unit Mission Design and Sequence of Events	Martin Marietta
	JSC-0770, Vol. XIV	Space Shuttle System Payload Accommodations	NASA/JSC
	ICD 2-19001	Shuttle Orbiter/Cargo Standard Interfaces	NASA/JSC
	ICD-03-0013-31	Shuttle Orbiter/Manned Maneuvering Unit and Flight Support Station Cargo Element Interfaces	Rockwell International
	JSC-17000	Manned Maneuvering Unit Flight Hardware End Item Specification	Martin Marietta
	ICD-HSD-40001-0D-0	Extra Vehicular Mobility Unit to Manned Maneuvering Unit Interface Document	Hamilton Standard
	MMU-SE-11-03	Manned Maneuvering Unit Design Data Book	Martin Marietta
	MMU-RA-15-01	Manned Maneuvering Unit Failure Modes and Effects Analysis/Critical Items List	Martin Marietta

(ENCLOSURE 3)

NASA/AF MEMORANDUM OF AGREEMENT ON REIMBURSEMENT OF LAUNCH AND ASSOCIATED SERVICES FOR USES OF THE SPACE SHUTTLE

DEFINITIONS

A. DOD-Sponsored Payload
A DOD Payload or a DOD-Cooperative Agreement Payload. A DOD Payload is a payload to which DOD has title or for which DOD has paid appropriated funds for its construction and launch. A DOD-Cooperative Agreement Payload is a payload procured by a foreign government or international organization (e.g., a NATO payload) from which the DOD will obtain direct and substantial benefits.

B. NASA-Sponsored Payload
NASA, Civil U.S. Government, Commercial, or foreign payload not sponsored by DOD.

C. KSC User
The responsible agent for the Payload being launched (i.e., Foreign, Commercial, NASA, DOD).

D. VAFB User
The responsible agent for the payload being launched (i.e., DOD or NASA). NASA will act as the agent for all users other than DOD-sponsored payloads.

E. Dedicated Flight
A Shuttle flight sold to a single user. DOD may at its election, offer space through NASA to other users (see Def G).

F. NASA Shared Flight
A NASA Shuttle flight that may contain a DOD sponsored paylaod.

G. DOD Shared Flight
A DOD dedicated flight with a NASA-sponsored payload(s) on board.

H. Postponement
To change, at the initiative of the user or the Mission Director, the scheduled date of lift-off of the Shuttle to a later date.

I. Termination
To delete, at the initiative of the user or the Mission Director, all or a portion of the planned payload operations after lift-off of the Shuttle.

J. Cancellation
To withdraw, at the initiative of the user or the Mission Director, a specific payload from flight consideration prior to lift-off of the Shuttle.

K. Limited Life Refurbishable Hardware
Flight Kits which extend the basic capabilities of the Shuttle (i.e., Orbiter Maneuvering System).

L. Serial Impact Time
Extension of the Orbiter timeline for mission unique purposes beyond the standard allocated to the mission. Includes time for mission unique flight kit installation; payload installation, checkout, and removal; on-orbit operations; and flight kit removal if not conducted within the standard allocation

M. Aborted Flight
A flight that achieves lift off but fails to achieve mission orbit or commence payload operations

N. Firm Schedule Requirement
Missions with firm, highly probable launch dates. These missions are schedule-critical and launch dates are established in the normal manifest revision process.

O. Planned Schedule Requirement
Missions which have medium to low probabilities of launching on dates which are determined in the normal manifest revision process. These include launches of replacement spacecraft which are typically keyed to forecasted degradation of on-orbit capability or launches of systems with high schedule risks in development, test, or delivery.

P. Launch-On-Demand
Unscheduled requirement of sufficient national priority to essentially pre-empt all other STS activities and force a launch at the earliest possible date.

Q. Delays
Unplanned schedule changes which occur during the Orbiter processing flow prior to launch. These impacts would be on the order of hours or days and called for in real time due to technical problems which arise during the pre-launch period.

R. Slips
Unprogrammed schedule changes requested prior to the Orbiter ground flow processing. This category includes requests made several weeks before entering the Orbiter flow or several months before arrival at the launch site. In each case, the request would ask for a schedule impact of weeks or months and perhaps not allow sufficient time to fill the newly-opened launch slot to recover the lost flight reimbursement.

S. Schedule Revisions
Programmed changes to the STS Manifest Baseline schedule that are defined far enough in advance to be accommodated within the normal manifest revision process.

T. Organic Capability
The Shuttle-related capability (manpower, hardware, facilities) required to implement the flight rate funded in the current President's Budget.

U. End to End Test
Demonstration of the ground support network capability to route, process and display mission unique data. Uses the actual hardware and software configuration of the specific mission. Performed as close to launch as possible without impacting normal launch activities (nominally L-2 weeks).

V. Additive Costs
Additive costs are those direct costs over the organic capability which can be identified readily with the particular program support. For range support, additive costs are those direct costs for optional services beyond those contained in the Standard Range and DDMS Support definition (Annex G). Direct costs include labor, material, construction, utilities, equipment, supplies, and any other resources damaged or consumed during testing or maintained for a particular user. The cost of each direct labor hour requires identification to a job or function served.

LIST OF ANNEXES

ANNEX A	Standard Space Shuttle Services Provided by NASA to the DOD
ANNEX B	Standard Space Shuttle Launch Support Services Provided by DOD to NASA
ANNEX C	Materials and Services
ANNEX D	Shared Flight Charge
ANNEX E	Representative Optional Services Provided by NASA to DOD
ANNEX F	Representative Optional Services Provided by DOD to NASA
ANNEX G	Standard Range and DDMS Support Provided by DOD
ANNEX H	AFSCF Optional Services Provided by the DOD to NASA
ANNEX I	Allocation of Risk Agreement
ANNEX J	Manifesting of Small Payloads

1.0 Purpose

This MOA delineates the policy and principles on reimbursement for launch and associated services for Space Shuttle.

2.0 Statement of Principle

2.1 NASA and the Air Force are partners in the development and operation of the National Space Transportation System. That partnership is reflected in this policy through the trade of manpower wherein NASA will provide the manpower required to operate those shuttle related facilties for which it is responsible and the Air Force will provide the manpower for those Shuttle related facilities for which it is responsible. Neither agency will charge the other for their organic manpower contributions.

2.2 The DOD, as a user of the Shuttle, should be charged no more than any other Shuttle user for the hardware elements of a Shuttle launch.

2.3 National interest and economy demands that both NASA and the Air Force strive for the most economical Shuttle operation possible. Both agencies agree to make the necessary investments required to realize this goal.

2.4 The Space Shuttle must provide both the expanded capacity and competitive prices necessary to attract non-government users.

3.0 Scope

3.1 This MOA defines the terms for provision of, and reimbursement for, Shuttle services.

3.2 This MOA and a Payload-unique Payload Integration Plan (PIP) constitutes a Launch Services Agreement between NASA and DOD for a particular DOD-sponsored Payload.

4.0 Authority

This MOA is a sub-agreement established under the authority of the NASA/DOD Memorandum of Understanding (MOU) on Management and Operation of the Space Transportation System dated March 27, 1980.

In the event of any inconsistency between documents, the following order of precedence shall be used in resolving such inconsistency: (i) the NASA/DOD Memorandum of Understanding on Management and Operation of the Space Transportation System dated March 27, 1980; (ii) this Memorandum of Agreement, including all annexes; (iii) the Payload Integration Plan other than the documents specified in (iv), (v), and (vi) except that in matters of safety the document "Safety Policy and Requirements" (NHB 1700.7) as modified by NASA approved waivers shall have precedence over the Payload Integration Plan; (iv) Payload Interface Control Documents referenced in the Payload Integration Plan; (v) Payload Integration Plan Annexes; and (vi) Payload Integration Plan Applicable Documents other than (iii) and (iv) above.

5.0 Responsibilities

5.1 NASA

5.1.1 NASA, as financial manager of the STS, is responsible for establishing STS prices and reimbursement policies for all non-DOD users.

5.1.2 NASA is responsible for, but will coordinate with DOD; (a) establishing and implementing the reimbursement procedures as they apply to DOD payloads, (b) establishing the category (standard vs optional) of launch services at KSC, and (c) establishing the STS manifest schedule.

5.1.3 NASA will be responsible for the preparation of the PIP's for all payloads to be launched from KSC and VAFB. NASA will coordinate PIP development with DOD where DOD elements are involved.

5.1.4 NASA will be responsible for the preparation of the Launch Site Support Plan (LSSP) for all payloads to be launched from KSC in coordination with the User. NASA will represent non-DOD Users in the development of the LSSP for a VAFB Launch.

5.1.5 NASA will provide and maintain Shuttle Interface Data and Kennedy Interface data.

5.1.6 NASA will provide and operate the facilities, general purpose equipment, ground software, and ground spares to perform the prelaunch, launch, landing, and ground turnaround activity for all Space Shuttle operations at KSC.

5.2 DOD

5.2.1 The DOD has designated the Air Force as the sole point of contact with NASA for all commitments affecting the STS and its use in matters regarding national security space operations and international defense activities covered by Government to Government agreements. This includes preparation of the DOD mission model to be used in Shuttle manifesting.

5.2.2 DOD will provide and operate the facilities, general purpose equipment, ground software, and ground spares to perform the prelaunch, launch, landing and ground turnaround activities for all Space Shuttle operations at VAFB.

5.2.3 DOD will support NASA in developing joint integrated STS logistics and training plans for use at JSC, KSC, and VAFB.

5.2.4 DOD will serve as the focal point for providing necessary data to NASA for hardware and software integration for DOD-sponsored Payloads.

5.2.5 DOD will be responsible for, but will coordinate with NASA,: (a) the preparation of the LSSP for all payloads to be launched from VAFB and (b) establishing the category (standard vs optional) of a launch service at VAFB, and (c) determining the minimum range safety support required at Eastern Space and Missile Center and Western Space and Missile Center to discharge the range commander's responsibility to protect life and property under DODD 3200.11.

6.0 Basic Reimbursement Principles

6.1 Standard Services

6.1.1 Only those services defined in Paragraphs 6.1.2 through 6.1.5 shall be considered as standard for reimbursement purposes.

6.1.2 Materials and Services

6.1.2.1 Materials and Services provided by NASA as standard services under this Agreement are defined in Annex C. As defined in Annex C, there are no Materials and Services provided by DOD as standard services under this Agreement.

6.1.2.2 DOD will pay $16.0M (FY 75$) for Materials and Services for all DOD launches in FY 84 and FY 85.

6.1.2.3 For DOD launches in FY 86 and beyond, DOD will pay estimated actual costs of Material and Services at rates identical to those charged to other users. These are currently fixed at at $29.8M (FY 75$) per launch for FY 86 through FY 88. Any changes to the fixed price will be provided 3 years prior to the launch year to provide sufficient time for inclusion in the appropriate DOD budget.

6.1.2.4 For flight of a DOD-sponsored Payload on a NASA-shared flight, DOD shall reimburse NASA a pro-rata share of the DOD dedicated price for Materials and Services. The basis of proration shall be the payload(s) charge factor as computed according to Annex D.

6.1.2.5 If a NASA-sponsored payload is flown on a DOD-shared flight, DOD shall reimburse NASA an amount which is equal to the DOD dedicated flight price for Materials and Services, less a pro-rata share of that price. The basis of proration shall be the non-DOD payload(s) load factor as computed according to Annex D.

6.1.2.6 NASA accepts the financial responsibility for development of the Shuttle systems to achieve the currently defined and documented maximum system performance as agreed to by NASA and DOD to meet national security requirements. These performance levels are documented in NASA Code M letter to the Under Secretary of the Air Force, dated 1 Feb 83. The hardware costs required to achieve the guaranteed performance will be borne by NASA. DOD will manifest missions based on the performance ceiling capabilities as guaranteed. Specific and detailed mission performance requirements shall be consistent with payload control weights stated in the individual payload integration plans for each manifested mission.

6.1.3 Launch and Flight Operations Exchange of Services

6.1.3.1 DOD shall provide standard launch support services as defined in Annex B for all non-DOD payloads and missions flown from VAFB.

6.1.3.2 NASA shall provide standard launch support services as defined in Annex A for all DOD payloads and missions flown from KSC.

6.1.3.3 NASA shall provide standard flight operations support services as defined in Annex A for all flights launched from KSC and VAFB until the operational availability of the Shuttle control capability of the Consolidated Space Operations Center. After a reasonable transition period, DOD will provide standard flight operations support services as defined in Annex A for all DOD flights through CSOC. NASA shall maintain configuration control of the Orbiters.

6.1.3.4 DOD does not pay NASA for any Shuttle related NASA Center manpower (government and contractors) supporting DOD launches. In return, NASA does not pay DOD for Shuttle related DOD manpower supporting a civil launch. This trade in manpower and launch services (Quid Pro Quo), which is based on the development and availability of launch services by the Air Force at the VAFB, is a fundamental criterion for the difference between the pricing of civil and DOD launches. Additional efforts beyond the organic capability will be provided at only additive costs. (An example, NASA and DOD will install/remove mission kits and payload peculiar hardware at their respective launch sites at no cost to each other as long as that effort is within organic capability).

6.1.4 DOD Secure Operations

DOD will pay the initial costs associated with acquiring secure provisions. DOD will provide security requirements to NASA. DOD will fund the recurring O&M costs of DOD security operations. The recurring costs for the national resource protection provisions for the Shuttle, separate and distinct from those above, will be borne by NASA.

6.1.5 Range and Satellite Control Facility (AFSCF) Support

6.1.5.1 In recognition of the joint nature of the STS program, all Shuttle launches shall be treated as DOD launches for range support reimbursement.

6.1.5.2 AF, as manager for the Eastern and Western Space and Missile Centers shall provide standard support services for both launch sites (Annex G).

6.1.5.3 The DOD shall fund all standard range support services for all Shuttle launches (DOD and non-DOD) beginning in FY 84.

6.1.5.4 All support over and above the standard support provided in Paragraph 6.1.5.2 shall be funded by the agency requiring the support and charges will be computed on the basis of additive cost as defined herein.

NOTE: Above provisions (Paragraphs 6.1.5.3 and 6.1.5.4) are subject to Secretary of Defense granting waivers under DOD Directive 3200.11 and DODI 7230.7

6.1.5.5 AF, as manager for the Air Force Satellite Control Network, shall provide network support (S-Band, UHF voice, control center and RTS operations, and acquisition and routing of data) as a standard service for DOD payloads. For NASA payloads and NASA sponsored missions, the AFSCF will provide similar mission support on a reimburseable basis in accordance with Annex H (see Paragraph 6.2.2).

6.2 Optional Services and Hardware

6.2.1 Annex E lists representative optional services to be provided by NASA on a reimbursable basis. It is agreed by both agencies that provision of these services are outside the scope of standard services (Paragraph 6.1). It is further agreed that provision of these, or other, reimbursable services is contingent on each agency's ability to do so, and on the mutual agreement of the two agencies on a price for the services to be provided.

6.2.2 NASA shall pay DOD for all optional services provided by DOD for non-DOD payloads (Annex F and Annex H).

6.2.3 DOD shall pay NASA for all optional services provided by NASA for DOD-sponsored payloads (Annex E).

6.2.4 All optional services and related costs shall be documented in the payload-unique Payload Integration Plan (PIP) and, for the Air Force Satellite Control Facility, in the Orbital Requirements Document (ORD). Both agencies will provide best efforts to identify optional service requirements and provide costs estimates as soon as possible.

6.2.5 The price for all optional services shall be based on additive costs (to organic capability). For purposes of this Agreement, the following specific provisions shall apply:

6.2.5.1 The using agency shall reimburse the providing agency the estimated actual costs of expendable hardware provided that is not directly associated with guaranteed performance (see Paragraph 6.1.2.6).

6.2.5.2 For limited-life refurbishable hardware, the using agency shall reimburse the providing agency a mutually agreed to share of acquisition costs, plus estimated actual refurbishment costs for each use.

6.2.5.3 Planned serial time impacts, beyond that addressed in Annex A and Paragraphs 6.3.2 and 7.2.6, will be reimbursed to NASA at a rate of $175,000 per day (24 hour day) in FY 75 dollars.

6.2.5.4 DOD shall supply to NASA, as needed, use fee schedules for the use of DOD facilities provided as optional services to certain non-DOD users persuant to 14 CFR 1214. NASA shall reimburse DOD any use fees collected for such use of DOD facilities.

6.2.6 DOD will pay the entire hardware cost of all payload peculiar hardware. If this hardware is not integral to the Shuttle system, such hardware will then become the property of DOD to be used at DOD discretion. In any case, the DOD will review and coordinate on any changes proposed for that hardware.

6.3 Postponement, Cancellation, Slip, Delay, or Termination Charges

6.3.1 Neither agency shall charge the other any pre-established fees for postponements, cancellations, slip, delay, or termination of services under this MOA. Postponed, slipped, or delayed flights within the fixed three year period will be flown on the new date with no additional payment for Materials and Services (see also Paragraph 9.1.4 for flight credit for flights excess to DOD needs).

6.3.2 For a user initiated postponement, cancellation, slip, delay, or termination the user shall reimburse the other agency the additive cost of any services which the other agency has provided up to the point of the postponement, cancellation, slip, delay or termination. For postponed, slipped or delayed flights, analytical/technical services which have been conducted and which are applicable to the new launch date will not require refunding. Analytical/technical services which have to be initiated or have to be reaccomplished for the new launch date will be funded as an optional service.

6.3.3 Charge for any unused or undamaged standard or optional services shall be credited to the appropriate agency.

6.4 Aborted Flights

For reimbursement purposes, aborted flights shall be treated the same as successful flights with the exception that any reimbursements for unused or undamaged standard or optional services shall be credited toward a reflight.

6.5 Manifesting of Small Payloads

See Annex J

7.0 Launch Scheduling

7.1 Scheduled Launches

7.1.1 DOD will provide a five year projection of their anticipated requirements by year. Each requirement will be identified as a mixed payload candidate or a dedicated DOD mission; each dedicated DOD mission will be further identified as (1) firm, or (2) planned.

7.1.2 All firm DOD missions will be manifested as nearly as possible on the dates requested.

7.1.3 A mutually agreed to percentage (nominally 50-70%) of the planned requirements will be manifested as dedicated DOD missions.

7.1.4 DOD will proceed with the integration process for all the remaining planned DOD-dedicated mission requirements. These will effectively be "double-booked" (either with other DOD cargoes or with NASA customers) to allow maximum flexibility in meeting the planned DOD requirements, but will not be scheduled against a specific flight in the STS manifest schedule.

7.1.5 NASA will develop the STS manifest schedule in cooperation with the Air Force. It will be assumed that the more realistic (as opposed to the maximum) DOD missions can be accommodated within the DOD allocation derived according to the guidelines above.

7.1.6 If the planned DOD requirements are underestimated and additional flights are needed, DOD will exercise the national security priority and NASA will defer the affected NASA-sponsored mission(s) as stated in existing policy.

7.1.7 The decision to implement a DOD dedicated mission must be made nine months before the scheduled launch date if NASA is to conduct efficient scheduling. The DOD will make every effort to comply with this constraint, but this decision will not affect the launch reimbursement policy (see Paragraphs 6.3.1 and 9.1.4).

7.2 Time Allocation

7.2.1 DOD will be allocated seven days per DOD dedicated STS mission, the aggregate of which could be allocated to ground flow time and/or on-orbit time for each mission and from mission to mission according to the following rules:

7.2.2 The maximum on-orbit time to be allocated per flight is six days in addition to the standard one day mission time. The minimum time allocated to ground flow time is three days.

7.2.3 The allocation of days will be based on the maximum DOD projections and will include all those low probability missions that will effectively be "double-booked" in the STS manifest.

7.2.4 Allocation of times (as specified in Paragraph 7.2) must be done prior to the first Cargo Integration Review (CIR) (nominally 18 months prior to the flight) of the given fiscal year. No credit will be maintained for allocated time associated with cancelled missions. Credit for postponed missions may be used only once.

7.2.5 DOD payloads manifested on non-DOD missions will use the pricing rules in this document but be subject to the standard STS mission ground rules for scheduling and time allocations.

7.2.6 If the allocation of the DOD time is insufficient to meet all DOD requirements, additional ground flow time can be purchased as an optional service at $175,000 per day (75$) and additional on-orbit time (not to exceed the seven day maximum) can be purchased at $175,000 per day (75$).

7.2.7 A mission allocation shall include any of the following which cannot be done in parallel with normal flow:

7.2.7.1 Time in the Orbiter Processing Facility to make Orbiter modification unique to the DOD mission.

7.2.7.2 Installation of the required payload unique kits.

7.2.7.3 Payload processing after the pad rotating service structure has been closed.

7.2.7.4 DOD required launch holds.

7.2.7.5 The length of the planned mission (launch to landing) minus any days on orbit from which NASA excludes payload operations.

7.2.7.6 Payload-caused extension of inflight or post flight activities with the Orbiter.

7.2.7.7 STS payload bay cleaning activities to meet a level 2 standard.

7.2.7.8 Time required for payload end to end tests over that allowed in the standard services.

7.3 Launch-on-Demand Launches

NASA recognizes the possibility of a totally unscheduled national defense requirement (Launch-On-Demand) and accepts the responsibility to pre-empt all other STS requirements to support its earliest possible launch and resolve the cost as soon as possible. Requests for such flights shall be approved by the Secretary of the Air Force. DOD shall reimburse NASA the dedicated flight price for Materials and Services for DOD Launch-on-Demand flights. Payments for these launches shall include standard services and optional services. DOD will reimburse NASA for Launch-On-Demand services in the fiscal year the services are performed.

8.0 Allocation of Risk Agreement

See Annex I

9.0 Billing and Payment

9.1 Standard Services - Reimbursement for Scheduled Launches (Paragraph 7.1) are as follows:

9.1.1 DOD standard launch service payments will be due on January 1 of the fiscal year prior to the fiscal year of launch.

9.1.2 DOD will commit to a three year rolling fixed then year or real year dollar payment schedule based on the DOD's best estimate of their maximum launch rate.

9.1.2.1 The initial three years to be fixed are defined in the FY 84 President's Budget where: the current year is FY 83; Budget year is FY 84; budget plus one year is FY 85.

9.1.2.2 This three year fixed payment schedule will be annually established through the exchange of formal correspondence at the time of the DOD submission of the Budget recommendation to the President (October/November). Each agency's budget submission to the OMB will incorporate and support this reimbursement baseline.

9.1.2.3 This three year rolling fixed payment schedule will be based on: 1) the applicable fixed standard service price identified in Paragraph 6.1 above; 2) Escalation projected on the basis of the Bureau of Labor Statistics bulletin as detailed in Paragraph 9.3; and 3) Adjustments in the fourth year for changes in DOD's actual or projected maximum launch rate (see Paragraph 9.1.4).

9.1.3 Payments for DOD launches within the fixed three year period will be made regardless of subsequent knowledge of changed requirements.

9.1.4 Any DOD flights within the fixed three year period which are later determined to be excess to DOD needs will be credited toward DOD requirements in the fourth year. Those flights credited to DOD in the fourth year will not require economic escalation. If the postponement by DOD is into a new pricing period, the difference between the old and the new price will be reimbursed in the fourth year. The differential will be subject to the escalation factors projected for the fourth year.

9.2 Optional Services

9.2.1 Optional service payments will be made as required to support implementation of the Payload Integration Plan (PIP).

9.2.2 Optional services will be funded by the requesting agency at a minimum of sixty days prior to the requested task initiation date. The agency providing the service will provide cost estimates to the requesting agency in time to both allow an orderly budget process and to meet the sixty day payment requirement.

9.3 Escalation of Payments

9.3.1 NASA is responsible for maintaining and annually updating the escalation values required to convert STS pricing data from data base values (currently FY 75 dollars) to then year or real year dollars.

9.3.2 Escalation will be determined on the basis of the U.S. Department of Labor, Bureau of Statistics bulletin titled, "Productivity and Costs," Table-1, Compensation Per Hour column.

9.3.3 Escalation will be fixed by NASA, in consultation with the DOD, for the budget year and will be projected consistent with overall NASA budget projections. Escalation estimates will be projected for budget plus one year for planning purposes only.

9.3.4 Escalation for Standard Shuttle services will be fixed for the three year rolling payment schedule.

9.3.5 No final cost reconciliation for escalation will be made beyond the above provisions.

10.0 Authentication

This MOA supersedes the MOA between NASA and DOD of March 7, 1977, entitled "Basic Principles for NASA/DOD Space Transportation System Launch Reimbursement" and, to the extent applicable to reimbursement for Space Shuttle services, it supersedes the "DOD/NASA Agreement--Reimbursement of Costs" dated November 17, 1959. This MOA is effective on the latest date of the signature below:

James M. Beggs
J. Beggs
Date 2/1/83

V. Orr
Date February 1, 1983

ANNEX A

STANDARD SPACE SHUTTLE SERVICES PROVIDED BY NASA TO THE DOD

I. INTEGRATION

A. Analytical integration includes the following NASA standard services:

1. Provide through the Payload Integration Plan (PIP) process, pre-Cargo Integration Review development and mission planning support to approved DOD payload programs. The standard PIP support includes such activities as, conceptual flight profile development, manifesting, Space Shuttle Vehicle (SSV) performance analyses, providing for one contingency deployment (per cargo element). NASA will provide representation to payload development meetings and reviews as mutually agreed to between the payload and the NASA Centers.

2. Provide STS environmental data, baseline Shuttle math models, and interface definitions for payload design.

3. Pre-Cargo Integration Review (CIR) development and mission planning support, and feasibility studies, or performance analyses as negotiated in the PIP process.

4. Conduct compatibility analyses between DOD cargo elements within a DOD-dedicated mission if joint analysis indicates its necessity. If a coupled loads analysis is warranted only additive costs will be charged.

5. Perform interface loads assessments and other analyses, as necessary, to assure compatibility between payloads and the Shuttle. These analyses are conducted in support of the Cargo Integration Review (CIR) (approximately 18 months before launch) to verify the flight worthiness of the cargo. Reaccomplish critical analyses in support of CIR which are necessary because of changes incurred to the SSV, models or facilities.

6. Prepare and maintain integration documentation (PIP, PIP Annexes, interface control documents (ICD), OMRS File II and OMI's, etc.).

7. Prepare orbiter flight operations support activities. If jointly determined as necessary based upon established criteria provide an Orbiter flight control stability analysis for each DOD flight.

8. Perform flight verification engineering analysis (approximately six months prior to launch).

B. Physical integration for KSC includes the following NASA standard services:

1. Provide the KSC launch site support management.

2. Provide security and safety notices normally provided as part of the KSC institutional capability. (NOTE: Generic DOD security provisions are funded by USAF Space Division and identified in KSC document (K-DOD-SM-02)).

3. Use of KSC Cargo Integration Test Equipment (CITE) for interface verification until such time the KSC DOD Orbiter Functional Simulator becomes operational.

4. Provide payload canister transportation to/from the Shuttle Payload Integration Facility.

5. Use of existing unsecured data links after the payload has entered the on-line facilities and is installed in the Rotating Service Structure (RSS) and the Orbiter.

6. Installation of the payloads into the RSS and the orbiter using the handling equipment and the Multi-Mission Support Equipment.

7. Verification of the interfaces between the installed cargo and the Orbiter.

8. Provide equipment, personnel, software, and facilities to support one payload end-to-end test (Commanding and response) after installation in the Orbiter.

9. Preparation of the Orbiter, during turnaround, for the succeeding flight, including reconfiguration of the flight vehicle to meet baseline capability and specifications. (Orbiter reconfiguration needed to achieve mutually agreed capability including performance, volume, etc.).

10. Installation and removal of Airborne Support Equipment.

11. Below is listed the allocation of times to the payload for payload peculiar/unique testing within the regular flow. Each user will be allocated a portion or the total time dependent on the payload load factor. These allocations are subject to change based on actual experience gained. For DOD allocations refer to Paragraph 7.2.

Cargo Type	Location	Cargo Peculiar Serial Time (Hrs)
Horizontal Cargo	O&C Bldg.	18 - After payload-to-simulated Orbiter interface verification timeframe
	OPF	8 - After completion of interface testing
Vertical Cargo	VPF	10 - After CITE timeframe
	RSS (PAD)	8 - Prior to arrival of Orbiter at the PAD
	PAD (Orbiter)	8 - After completion of interface testing

12. If required, the Orbiter payload bay liner will be installed and cleaned to meet Level 2 inspection standards, as defined in JSC SNC 0005. The time to conduct this activity will be included as a part of that mission's allocation of time.

13. Provide and maintain standard Orbiter integration hardware items used in the cargo integration (Level II and Level I) process in-flow at KSC: keel fittings, latches, cable trays, etc.

II. MISSION/FLIGHT OPERATIONS

A. NASA will provide mission planning and flight operations for all launches from KSC and VAFB until the operational availability of the Consolidated Space Operation Center. Details of the mission/flight operations are specified in the jointly-coordinated Baseline Operations Plan. This plan also addresses provision, by NASA, of a secure environment at JSC and KSC.

B. Training and simulation will be provided by NASA to all STS crew members and STS ground operations personnel for DOD missions launched from KSC and VAFB. This task will be accomplished by DOD through the Consolidated Space Operations Center once it is operationally available for Shuttle flights.

C. Standard Mission Orbits from KSC

1. With respect to DOD dedicated flights or DOD-shared flights from KSC into the user's choice of two standard mission orbits: 160 NM circular orbit, 28.5° inclination (nominal), or 160 NM circular orbit, 57° inclination (nominal):

(i) Launch on any date, selected by NASA, from a launch period beginning on the planned launch date and ending 90 days thereafter. Once the firm launch date is established, the launch period shall begin on that date and end 30 days thereafter.

(ii) Launch window will be selected by DOD for a DOD dedicated mission.

(iii) Launch window will be jointly selected by NASA and DOD for a DOD shared flight.

2. With respect to NASA shared flights from KSC to the standard mission orbit of 160 NM circular orbit, 28.5° inclination (nominal):

(i) Launch on any date, selected by NASA, from a launch period beginning on the planned launch date and ending 90 days thereafter. Once the firm launch date is established, the launch period shall begin on that date and end 60 days thereafter.

(ii) Launch at any time of day, selected by NASA, from either of two launch windows, one centered on 13:35 GMT and the other centered on 01:35 GMT. The total width of these launch windows shall be two hours.

3. With respect to NASA-shared flights from KSC to the standard mission orbit of 160 NM circular orbit, 57° inclination (nominal), with certain NASA-determined launch constraints: The nominal launch window and launch time will be determined by NASA in consultation with the users.

D. Provide Orbiter periodic navigation timelines and accuracies until the payload is deployed.

E. Provide real-time support of Orbiter mission replanning.

F. Provide verification of command and data links established between STS elements; NASA centers (KSC, JSC, GSFC), USAF sites (control centers and range operations centers, and communications satellite links).

G. Provide a four person flight crew consistent with mission specific requirements as identified by the user. In the event DOD mission requirements dictate extra crew members, NASA will, with DOD concurrence, assign from the cadre of astronauts the basic crew, extra personnel, and provide STS training. The DOD payload organization will provide payload specific training. Alternately, DOD may provide personnel from outside the NASA cadre as payload specialists. For these payload specialists, the payload organization will provide payload specific training and NASA will provide STS training as an optional service. The weight of the extra crew and provisioning will be considered payload chargeable weight for a shared cargo flight.

III. POST-FLIGHT OPERATIONS

A. NASA will remove the payload from the cargo bay as a standard service after a flight is returned to a landing site other than VAFB. If requested by the user, NASA will provide payload transportation from any contingency landing site to the primary launch site.

B. Provide standard postflight SSV data, analyses, reports and documentation on a schedule specified in the PIP.

ANNEX B

STANDARD SPACE SHUTTLE LAUNCH SUPPORT SERVICES PROVIDED BY DOD TO NASA

A. Provide launch site operations management, and conduct the launch of all NASA missions from VAFB.

B. Provide Space Shuttle Vehicle (SSV) launch services for all NASA flights from VAFB. All SSV-associated operations from Orbiter landing through SSV launch are included.

C. Use of Interface Verification Equipment for STS interface verification tests.

D. Provide use of on-site data links to NASA on-site communication network for monitoring and testing NASA payload functions after it has entered the STS on-line facilities and is installed in the Payload Changeout Room and the Orbiter.

E. Provide the resources required to install the NASA payload into the Payload Changeout Room and the Orbiter and to remove a returned NASA payload from the Orbiter using STS handling equipment.

F. Install and remove Airborne Support Equipment.

G. Provide the resources for abort operations to remove NASA payloads from the Orbiter at launch site (VAFB).

H. Provide security, safety and environmental control in the facilities as specified in the Launch Site Support Plan.

I. Verification of the interfaces between the installed cargo and the Orbiter.

ANNEX C

MATERIALS AND SERVICES

Materials and services costs include the Space Shuttle Systems estimated costs incurred by the government for the procurement of all standard recurring flight hardware costs for the Space Shuttle Main Engine, External Tank, Solid Rocket Boosters, Orbiter spares, and Crew-Related equipment. This includes the ground support equipment and Operations and Maintenance Documentation (OMD) required to support the flight hardware.

Space Shuttle Main Engine (SSME)

SSME support includes engine overhauls, off-line refurbishment at contractors plant, spare SSME(s), off-equipment component repair, support equipment, spare parts, OMD, and item management including sustaining engineering associated with the SSME. Costs are also covered for: (1) propellants for anomaly resolution and overhaul acceptance test; (2) transportation of spares and engines; (3) engine test support at the National Space Technology Lab (NSTL); and (4) computer support services at Slidell Computer Complex (SCC).

External Tank (ET)

ET support includes supply of operational tanks and tank systems, off-equipment component repair, support equipment, spare parts, OMD, and item management including sustaining engineering associated with the ET. Costs are also covered for: (1) operations of and logistics support for the ET barge; (2) first destination transportation for vendor shipping; (3) pressurants/propellants used by prime contractor; (4) support services at Michoud Assembly Facility including utilities, communications, and facility operating contracts; (5) support services at SCC; and (6) ET range safety systems.

Solid Rocket Booster (SRB)

SRB support includes supply of operational SRB(s), refurbishment of Solid Rocket Motors (SRMs) and SRB subsystems, procurement of SRB recovery systems, off-equipment component repair, support equipment, spare parts, OMD, transportation of SRB and subsystems between launch sites and contractor's plants, and item management including sustaining engineering associated with the SRB. Also includes capital investments and operations and maintenance costs for SRB range safety. All SRB configurations (including Filament Wound Cases) are included.

Orbiter Spares

Spares support includes initial and replenishment spares consisting of line and shop replaceable units and bits and pieces for the orbiter and orbiter ground support equipment required to support hardware maintenance throughout the operational phase. These spares support Shuttle operations at KSC, VAFB, and JSC (SAIL and DPS). Maintenance is included for off-equipment level repair. Spares costs do not include costs for propellant/gases expended on each flight, ancillary GFE, or labor costs for on-equipment level maintenance.

Crew-Related Government Furnished Equipment (GFE)

Crew-related GFE support includes replacement spares, replenishment hardware, field support, and maintenance support for crew-related Government Furnished Equipment (GFE). Particular items covered but not limited to are as follows: headsets, crew equipment and software, EMU (suits, PLSS, etc.), EV comm system, initial GSE and HMS explosives, portable 0_2 system, radiation instrumentation, survival radios, cameras, closed circuit TV, other individual procured items such as watches, pens, pads, etc.

Contract Administration

Service includes the Contract Administration functions and related costs to administer the contracts associated with providing the above Shuttle support.

ANNEX D

SHARED FLIGHT CHARGE

To calculate the cost of individual payloads transported on a flight shared with other payloads:

(1) Find the load factor for the payload by dividing the payload weight by the Shuttle capability for the desired inclination (Table in Figure 1).

(2) Find the load factor for the payload by dividing the payload length by 60 feet.

(3) Enter the curve (Figure 1) at the higher value obtained from steps 1 and 2 and read the Charge Factor (C_f) from the curve.

(4) Multiply the C_f value times the quoted price per dedicated flight. This will result in the price for the payload flight.

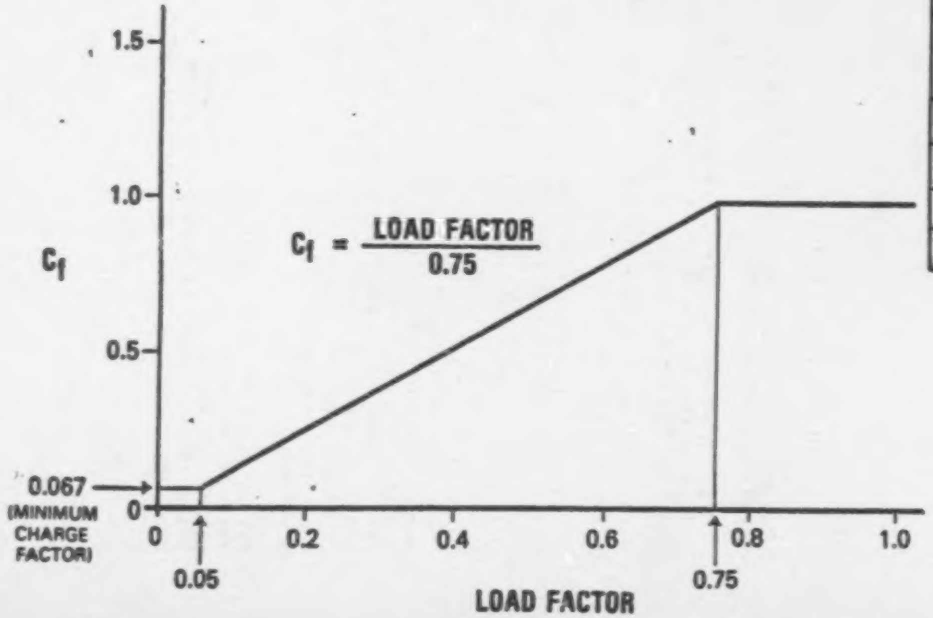
The price for each payload flight (Step 4) entitles the user to be provided a pro-rata share of the facilities available on board the standard Shuttle flight. For example, if the payload load factor is 0.5, then the payload is entitled to 50% of the power, cooling, and other services provided on the standard flight. Standard services required that exceed the pro-rata share will be an additional charge to the user based on the cost of the service provided.

For purposes of this attachment, payload weight includes a pro-rata share of all special equipment (e.g., spin tables and their controls) needed for the user's mission. Payload length includes a pro-rata share of the clearance length necessary to operate or deploy the payload, including the length of deployment mechanisms.

DETERMINATION OF CHARGE FACTOR (Cf) FOR 160 NMI

$$\text{PRICE} = C_f \times \text{DEDICATED PRICE}$$

$$\text{LOAD FACTOR} = \left\{ \begin{array}{c} \dfrac{\text{PAYLOAD WEIGHT, LBS}}{\text{SHUTTLE CAPABILITY}} \\ \dfrac{\text{PAYLOAD LENGTH, FT}}{60} \end{array} \right\} \text{WHICHEVER IS GREATER}$$



SHUTTLE CAPABILITY	
INCLINATION IN DEGREES	WEIGHT IN THOUSANDS OF POUNDS
28.5	65
56	57
90	37
104	30

ANNEX E

REPRESENTATIVE OPTIONAL SERVICES PROVIDED BY NASA TO DOD

Services, requested by a user, which are beyond the organic capability of the NASA centers involved, are considered optional services. NASA will undertake any reasonable optional service that DOD can adequately define and that NASA can capably perform. Each optional service for a particular payload is scoped technically, and cost estimated in the Payload Integration Plan (PIP). Upon receipt of the required funds from the user, the service is implemented. Some optional service items, once developed and implemented, will become a standard service for subsequent identical use of the service; examples include: variable Iy targetting, non-standard inclination and attitude, and integration hardware. The following items are of particular interest to the DOD and are deemed optional services if not within organic capability:

A. Analytical Integration

1. Provide preliminary and design integrated loads and thermal analyses in support of payload design. Reaccomplishment of payload specific analyses due to changes in the Space Shuttle Vehicle (SSV), models or facilities is a standard service.

2. Supply current loads and thermal math models for specific payload integrated loads or thermal analyses.

3. Provide payload specific radiated energy mapping of the Orbiter cargo bay.

4. Review the DOD interface verification plan and support planning for the use of NASA facilities (SAIL, ESTL, etc.) for interface verification tests. Conduct the interface verification tests noted above, and provide the certification that Orbiter payload interface verification tests were successfully completed.

5. Provide mission and flight planning for non-standard launch trajectories and orbits.

6. The standard mission duration per payload is defined in Paragraph 7.2. Additional days are optional.

B. Physical Integration

1. Provide Cargo Integration Test Equipment, personnel, software, and facilities to conduct interface verification tests of DOD payloads beyond that necessary to insure the payload to Orbiter interfaces (Payload End-to-End testing).

2. The use of off-site NASA data links to NASA interface equipment.

3. Cleaning of the Orbiter payload bay liner to meet better than Level 2 inspection standards (to DOD requirements).

4. KSC support services and management for payload-peculiar testing/activities or Level IV integration.

5. Any DOD payload-unique security requirements over and above those provided by NASA as a standard service within the institutional capability. This includes unique security measures at contractor facilities supporting payload integration activities.

6. Provide standard Orbiter integration hardware for any off-line payload unique testing or integration activities (Level III or Level IV).

7. If it exceeds organic capability, any of the following:

   - Testing beyond that normally provided by NASA to check out, verify, and assure DOD the integrity of the SSV/payload interface.
   - Assisting DOD to load/unload payload propellants and to install/remove payload ordnance.
   - Installation, removal, and use of Orbiter Extension Flight Kits to meet payload unique requirements.

C. Mission/Flight Operations

1. Provide mission flight operations analyses over and above that provided as a standard service prior to the Cargo Integration Review.
2. Provide STS flight training for user-identified payload specialists.
3. Use of the JSC Payload Operation Control Center facilities.
4. Planned Extra Vehicular Activity in support of payload requirements.
5. Extra days on orbit.
6. Additional planning required for a revisit/retrieval (above that of a deployment mission).

D. Launch Services

National Priority launch service (excluding Materials and Services) are optional service if beyond organic capability. Allowed costs do not include costs incurred by other STS users due to impacts on their schedules. Additive costs incurred by NASA will be reimbursed by DOD.

E. General

Defined prices for optional services are directly subject to the scope of the service requested by the payload user. Each service is jointly defined in the PIP. Reference should be made to STS Reimbursement Guide JSC 11802 for guideline information on costs for frequently requested optional services. This document addresses all elements of the STS including the Spacelab, the IUS, and the SSUS programs. Cost for those services defined to be wholly or partially within the organic capability will be defined in the PIP.

ANNEX F

REPRESENTATIVE OPTIONAL SERVICES PROVIDED BY DOD TO NASA

TBS

ANNEX G

DOD STANDARD RANGE AND DDMS SUPPORT TO STS SHUTTLE PROGRAM LAUNCHES

1. PURPOSE - This Annex defines the Standard Range and DDMS Support to be provided to NASA by the DOD in support of The Space Transportation System Program.

2. SCOPE - Standard Range Support encompasses the repetitive range support activities to be provided by the DOD from the Major Range and Test Facility Base (MRTFB), as defined in DOD Directive 3200.11, for the prelaunch, launch and landing phases of the Shuttle program. Standard Range Support consists of base operations support, technical range operations and instrumentation support, programmatic photographic support (as mutually agreed between NASA and DOD), and associated management planning and control effort. One successful NASA/DOD End-To-End Test, if requested by NASA, and all DOD required tests to insure range capability to support mission readiness are standard services. Standard Range Support excludes those items identified in paragraph 3 below. All range support requirements must be specified by NASA in the Universal Documentation System (UDS). Commitments for support of these requirements will be specified by the Lead Range also in the UDS format. In addition to Standard Range Support the DOD agrees to provide a DOD Manager's Space Shuttle Support Office (DDMS) staff to coordinate contingency search and rescue crew egress and medical evacuation support (does not include travel or TDY of DDMS personnel and aircraft and related operational costs).

   a. Prelaunch phase extends through the pickup of the ELS Range countdown at approximately launch minus 12 hours.

   b. Launch phase extends from the end of the prelaunch phase through the end of the Abort-Once-Around landing opportunity.

   c. Landing phase extends from the beginning of the third orbit prior to the planned landing orbit until wheels stop at the primary or alternate landing sites.

3. The following items of support are not included in Standard Range and DDMS Support but can be provided to NASA on an additive cost basis as defined herein.

   a. Range instrumentation ships.

   b. Port Canaveral tug services.

   c. Base operations and manpower support to the refurbishment of the Shuttle Solid Rocket Motors. (This support is considered part of the Material and Services under the provisions of Annex C to this MOA).

   d. Documentary, public relations, standby still and motion picture photography.

   e. Purchased electrical and water utilities.

   f. Instrumentation additions and modifications for the exclusive support to the Shuttle program.

   g. Contingency search and rescue egress and medical evacuation support provided by the DOD Manager's Space Shuttle Support Office (DDMS) above the standard organic capability of the DDMS staff. Travel or TDY of DDMS personnel, aircraft and related operational support costs shall be reimbursed in accordance with DOD rates.

h. On-orbit tracking by MRTFB instrumentation from the end of the launch phase to the beginning of the landing phase.

i. Institutional (non-program) support at Cape Canaveral Air Force Station.

j. All direct commercial and foreign payload support.

4. Funding Responsibility - Effective in FY84, funding for Standard Range Support at ESMC and the other elements of the MRTFB is the responsibility of the Air Force. Support requirements requested by NASA which exceeds the Standard Range Support levels specified in the UDS response documentation will be negotiated on a case-by-case basis prior to commitment of that additional support and with proper budget lead time. Charges for nonstandard support will be on an additive cost basis as defined herein.

ANNEX H

AFSCF OPTIONAL SERVICES PROVIDED BY THE DOD TO NASA

This Annex will cover network support provided by the Air Force Satellite Control Facility (AFSCF) in support of NASA or NASA sponsored missions. AFSCF will undertake any reasonable optional service that NASA can adequately define and that the AFSCF can capably perform. The AFSCF is a multi-ops DOD support network run on a DOD priority basis in which each DOD mission competes for available AFSCF resources. As such, no specific organic capability can be guaranteed over any one period. AFSCF support is provided based on the timely receipt, technical scoping and costing of an Operation Requirement Document (ORD) which states the user network support requirements. The AFSCF prepares an Operational Support Plan (OSP) which is the AFSCF response and basis for agreement on what support can reasonably be provided to the ORD. The following services and support are deemed optional.

A. Pre-Mission Support

1. Provide manpower and facility support for review of NASA requirements and preparation of AFSCF technical and cost scoping response.

2. Support of NASA mission and flight planning reviews and meetings.

3. Preparation of documentation, training and familiarization of personnel in support of the NASA mission.

4. Testing, to include validation and verification of necessary AFSCF support and interfaces with NASA and the AFSCF network.

5. Readiness activities leading to launch.

B. Network Modifications

1. Funding of those modifications to the existing network deemed necessary to support NASA requirements.

2. Modifications which result from direct mission requirements or as a result of additional capabilities to handle increased network loading.

3. Modifications shall include necessary documentation and logistics support.

C. Launch and On-Orbit Operations

Provide support at a Mission Control Complex, Remote Tracking Stations and AFSCF Technical Facilities.

D. Post-Mission Support

1. Provide post mission analysis, support and reporting.
2. Return the AFSCF network to its standard DOD operational configuration, when applicable.

E. General

1. Identification of requirements and funding is a function of mission complexity and impact to the AFSCF operating configuration. Procedures defining leadtimes and costing requirements will be defined in an AFSCF and NASA agreed to Implementing MOA for AFSCF support of NASA programs.
2. Identification of NASA requirement and AFSCF support will be through the AFSCF and NASA documentation systems.
3. Unless specified otherwise, support of NASA missions will utilize the AFSCF Controlled Mode Configuration.
4. Funding of the optional services defined in this annex shall be based on additive costs as defined herein plus the cost of TDY and travel expenses.
5. NASA will provide a five year projection of their maximum anticipated requirements by year.

ANNEX I

ALLOCATION OF RISK AGREEMENT

TBS

ANNEX J

MANIFESTING OF SMALL PAYLOADS

TBS

(ENCLOSURE 4)

UPPER STAGE/PLANETARY MISSION COST COMPARISON
(Millions of Dollars)

	FY 1982		FY 1983		FY 1984		Total FY 1982 and Prior Through Completion	
	Total	Planetary Only	Total	Planetary Only	Total	Planetary Only	Total	Planetary Only
USING INTERIM UPPER STAGE *								
Transportation Stages and Integ.	97	46	104	73	130	60	433	229
Science Galileo and International Solar Polar Mission	125 222	125 171	114 218	114 187	90 220	90 150	673 1106	673 902
USING LONG WIDE-BODY CENTAUR Galileo and ISPM May/June 1986								
Transportation Stages and Integ.	135	86	204	179	194	183	690**	604
Science Galileo and International Solar Polar Mission	121	121	98	98	88	88	614	614
Total	256	207	302	277	282	271	1,304	1,218
Additional requirement for modification and acceleration of Pad-36B to support two launches in 1986 window	0		+26		+3		+9 (NET)	

* IUS/Planetary Upper Stage development was terminated July 21, 1982, in accordance with P.L. 97-216. Comparable Program estimates to STS/Centaur are not available. These estimates were included in the FY 1983 budget to launch Galileo in 1985 and ISPM in 1986.

**The Centaur toals do not include the Centaur required for the Venus Radar Mapper.

(ENCLOSURE 5)

Geodynamics Activity and Funding
(in millions)

Activity	Agency	Funding	
		FY 1983	FY 1984
o Measurement and analysis of regional and global scale crustal motion and deformation	NASA USGS	19.6 5.2	20.8 5.0
o Studies of crustal motion and earthquake-related phenomena	USGS NSF NGS	31.0 5.8 0.5	26.5 6.4 0.8
o Measurement and analysis of polar motion and variations in Earth's rotational rate	NASA NGS	3.9 1.0	4.2 1.5
o Modeling of the Earth's gravity and magnetic fields	NASA USGS NGS	0.8 2.1 0.3	1.0 1.9 0.3
o Theoretical studies of Earth processes	NASA NSF USGS	1.0 8.9 3.5	1.1 11.6 3.0
o Advanced systems development	NASA DMA NGS	0.9 1.0 0.5	0.9 1.0 0.5

FY 1984 BUDGET
SPACE STATION FUNDING SUMMARY
(millions of dollars)

	FY 1983	FY 1984	Budget Justification Book Reference
ADVANCED PROGRAMS			
Studies (Space Station Task Force)	4.0	6.0	RD 1-35
SPACE RESEARCH AND TECHNOLOGY			
R&T Base (generic)	(29.2)	(29.4)	RD 13-3 to 13-21; RD 13-26
R&T Base Augmentation (specific)	--	6.0	RD 13-26 - RD 13-28
SPACE SCIENCE AND APPLICATIONS			
Physics and Astronomy, Spacelab Payloads (studies)	(.2)	2.0	RD 3-9, -10
TOTAL, NASA	33.4	43.4	
TOTAL, NASA (without Space R&T generic)	4.0	14.0	

Revised
3/1/83

( ) = Non - Add to Space Station Total

QUESTIONS SUBMITTED BY SENATOR HUDDLESTON

Space Telescope

Question: The Space Telescope is experiencing cost overruns of over $200 million and facing a 12 to 18 month launch slip. How did this situation develop? What is your current estimate of the total cost of the overrun? How much of the overrun will have to be covered in FY 1983, FY 1984 and the outyears?

Answer: The Space Telescope project is one of the most challenging technical developments undertaken in the history of NASA. This was recognized from the initiation of the project and substantial reserves were provided in the NASA estimates to accommodate potential technical problems. The problems have occurred and the development complexity has exceeded the assessments on which the reserves were based. In addition, the management interfaces have not been monitored adequately, both by the contractors and NASA, and this led to late recognition of the near-term resources requirements and the extent of the schedule impact. The Space Telescope project is now being rebaselined. Our current estimate is an increase of at least $200 million in the runout cost and a 12 to 18 month launch slip. We now estimate an additional $45 million requirement in FY 1983 and approximately $75 million additional in FY 1984 with the remainder of the runout in the outyears.

Question: How do you propose to cover the overrun in FY 1983? FY 1984?

Answer: The current NASA approach to cover the additional Space Telescope funding requirement in FY 1983 is to transfer $15.4 million from within Physics and Astronomy; $3.3 million from Space Applications; and $26 million from Space Transportation Operations. The specific areas where funding would be provided from within Physics and Astronomy is Missions Operations and Data Analysis, specifically from Space Telescope operations and maintenance/refurbishment ($12.0 million) which will stretchout these activities consistent with the Space Telescope development stretchout; and $1.4 million will be transferred from Explorer Operations which will add only a minor risk to performing the planned FY 1983 Explorer Operations activities. In addition, $2.0 million will be transferred from Spacelab Payload Development and Mission Management, specifically by stretching out the Solar Optical Telescope development activities, and $0.3 million will be made available from Research and

Analysis. The $3.3 million from Space Applications will be made available from the Landsat-D funds as we have made excellent progress on the Landsat-D prime activities. The planned reprogramming of $26 million from Space Transportation Operations will be made available from the planned $34.5 million deferral of Shuttle Operations funding. Use of the planned deferral funding will reduce flexibility in responding to FY 1984 transportation operations program requirements; however, we believe this reduced flexibility is acceptable.

NASA has not yet determined how it will make the additional FY 1984 funding requirement for Space Telescope available as of this time. We will inform the Committee as soon as we have reached a recommended position on this matter.

Question: Certain of the Space Telescope problems, such as mirror contamination, would seem to be contractor responsibilities. Will the contractors be held responsible for the cost overruns? How?

Answer: The Space Telescope contractors will be held responsible for cost overruns. The Space Telescope development contracts are cost-plus-award-fee contracts. Cost overruns incurred to meet contract requirements are not subject to base or award fee. In addition, cost performance is one of the criteria for receiving award fee on a contract. Poor cost performance would result in a lower award fee for that contractor.

Question: When do you now expect a launch? Do you currently anticipate any mission degradation?

Answer: The Space Telescope program is currently being rebaselined as a result of the current technical difficulties. The results of the overall program review will most likely be available late this summer and then a new launch readiness date will be established; however, our preliminary assessment is a launch slip of at least one year.

We do not anticipate any mission degradation as a result of the slip in the Space Telescope launch.

Landsat

Question: Does NASA have a Research and Development (R&D) of follow-on technology for the Landsat program?

Answer: NASA does have a comprehensive R&D activity in the Multispectral Linear Array (MLA) technology activities which are developing a technology and science base potentially applicable to a Landsat type system. Three parallel focal plane development efforts are in process. These efforts include the development of mercury cadmium telluride (HgCdTe) and Schottky barrier shortwave infrared (SWIR) linear array modules. In addition, instrument design studies have been conducted and have resulted in several innovative free-flyer MLA instrument concepts which possess capabilities beyond the current Thematic Mapper instrument. While the focus of the current effort is on Shuttle instrument hardware development and deployment, the generic nature of the current technology efforts are providing a strong technology base which might be used for any potential Landsat follow-on.

Question: Do you expect to request any funding for Landsat beyond FY 1984? If so, for what purposes?

Answer: At this time, NASA currently has no plans to request any funds for Landsat development or operational data processing activities beyond FY 1984.

Question: What was your request to OMB for Landsat in FY 1984?

Answer: NASA requested $15.8 million for the Landsat project in FY 1984. These funds will be used to operate the Landsat Thematic Mapper data processing ground systems and to complete NASA's engineering characterization of the Thematic Mapper data.

Question: Two panels reported to the Commerce Department regarding the proposed commercialization. NASA had representatives on each; in fact, one panel was headed by Goddard's deputy comptroller. That panel concluded that COMSAT's estimates of savings were incorrect. Would you comment on that?

Answer: COMSAT made some assumptions about the current and projected NASA and NOAA expenditures and the savings that would accrue if the COMSAT Earth Star proposal were accepted. The cost of the NASA weather and Landsat research; launch of Landsat-D prime; tracking and data relay operations, and the NASA personnel costs were underestimated according to the report of the Government Business Review Panel on Industry Responses on Commercialization of Civil Remote Sensing Systems dated November 10, 1982. NASA had no basis on which to argue with this panel's conclusions, or with the COMSAT proposal.

Senator Huddleston—Continued

Question: The so-called Peck group expressed concern about future high risk R&D efforts, if the private sector took over. Would you comment on that?

Answer: The Land Remote Sensing Satellite Advisory Committee, chaired by Michael Halbouty, did find that the industry could do some land remote sensing R&D, but expressed concern that the industry would be less able to undertake fundamental, high risk and long term research in the land and meterological areas. NASA believes that the Government should support the fundamental long term R&D, and this policy is reflected in the 1984 budget for remote sensing activities for which NASA is responsible.

Question: The United States has been a leader in the development of remote sensing technology. With Landsat operations being transferred to NOAA, do you foresee a continued role for NASA in the generic R&D area? If the commercialization proposals should be adopted, would you expect the NASA R&D effort to continue?

Answer: NASA definitely has a continued role in the generic remote sensing R&D area. NASA involvement in research relating to the observational science of remote sensing has proven the utility of Landsat Multispectral Scanner (MSS) data in a number of applications. NASA research in remote sensing has also demonstrated that our capability in remote sensing is still its infancy. Therefore, in order to realize the full long-term benefits of remote sensing technology, NASA must continue to pursue this type of research aggressively. This is particularly important since the research is characterized by a fundamental, high-risk and longer term nature.

Question: If Landsat-D prime is launched in 1985 as planned and if it transmits for three years, then a follow-on would not be launched until 1988. Since the satellite takes about four years to build, a follow-on would presumably have to be initiated in FY 1984 to insure program continuity.

Is that correct?

What do you expect the state-of-the-art in land remote sensing to be in 1988?

Will the United States be competitive?

If the United States began work now, what new technology might be incorporated into the 1988 launch?

Answer: The construction of an exact duplicate of Landsat 4 and D prime could be accomplished over a three to four year period. Any significant modifications to the existing design of the Landsat 4 spacecraft and sensor system would add additional time to the development and flight certification schedule.

The primary sources of global land remote sensing data in 1988 will be the Landsat and SPOT spacecraft. A limited quantity of experimental data acquired by advanced sensors on the Space Shuttle will also be available such as data collected by the planned series of Shuttle imaging radar experiments.

Data produced by the U.S. Landsat spacecraft is expected to be competitive in the 1988 timeframe. Landsat's current measurement capabilities could be eclipsed by advanced sensors that will be launched by other nations in 1990 and beyond.

If the United States began work now, it would be possible to incorporate multispectral linear array (MLA) technology in the next generation of Landsat-type spacecraft. MLA technology would offer a unique opportunity to expand the spectral resolution of orbital imaging sensors by adding more spectral channels that would be individually sensitive to a narrow range of reflected solar radiation. Data from aircraft experiments with prototype MLA sensors does indicate that improved spectral resolution would lead to major advances in our ability to identify and map surface materials.

Question: I understand that the Senate authorization Committee may add funds for upper atmospheric remote sensing and oceanic sensing. If so, what directions would NASA pursue in terms of research?

Answer: NASA believes that the FY 1984 budget request is adequate for pursuing a balanced remote sensing research program. However, if additional funds were made available in the area of atmospheric sensors, it would be used to begin the definition studies of an advanced passive temperature sounder as research and technology advances have indicated that this is an area which could provide substantial returns for understanding large scale atmospheric behavior.

If additional funds were made available for oceanic remote sensing, they would be used to pursue detailed definition studies and breadboard activities for a spaceborne scatterometer and/or for the Series X advanced tracking system.

Question: Based on your experience, do you believe a private enterprise could continue international cooperation in land and weather remote sensing? What problems would you foresee?

Answer: Private industry could continue international cooperation and remote sensing, because it would be in their best interest to foster and develop international markets. The private sector should be in a better position to develop these markets than the Federal Government.

Question: Several countries are working on remote sensing operations, including the French. Which other countries are pursuing remote sensing? How does U.S. technology currently compare with that of other countries? Do you believe the United States could remain competitive with these countries, if commercialization took place?

Answer: Japan, the European Space Agency, India, Canada, the Federal Republic of Germany (instruments), and Brazil are pursuing remote sensing. Of these, India has launched very rudimentary sensors, German instruments (MRSE, MOMS) will be flown on the Shuttle. See attached set of charts (Enclosure) which portray our understanding of the foreign remote sensing activities and plans.

The United States now has a preeminent position compared to other nations with our current generation of "operational" sensors. NASA expects to continue to support advance technology R&D for sensors. Of the foreign countries involved in remote sensing, France and Japan are planning sophisticated (multilinear array) sensors.

Market opportunities are expected to provide incentive for the U.S. private sector to be competitive and to utilize NASA and private sector R&D to develop follow-on sensors and missions.

Question: What was the impact on NASA personnel of transfer to NOAA of Landsat operations? How many NASA personnel will be involved with Landsat in FY 1984? Where are they located? What are future plans for these employees?

Answer: The transfer of Landsat operations to NOAA has had a minimal impact on NASA staffing and personnel levels. Engineers and managers responsible for the construction, launch, and checkout of Landsat 4 are in the process of being re-assigned to other flight projects. A large number of NASA field center researchers are currently involved in the analysis and evaluation of Landsat-4 data. More that fifty scientists located at the Goddard Space Flight Center, the Johnson Space Center, the Ames Research Center, and the National Space Technology Laboratories are currently participating in Landsat-4 data analysis activities. These investigators are generally working on several different projects in a parallel fashion. The transfer of Landsat operations to NOAA has had little, if any, effect on their activities. They will continue to conduct research in remote sensing techniques in the future, and will use Landsat data as appropriate.

Fifth Orbiter

Question: It appears that both the House and Senate Authorization Committees will add funds looking toward a fifth orbiter, although the items to be procured with the funds differ. Do you have a preference for one approach over the other?

Answer: We have not fully examined the two different approaches of the House and Senate regarding additional funds for fifth orbiter structural spares procurement. The Administration's position has been that the $100 million in the FY 1984 budget is sufficient to initiate the structural spares procurement and to retain a reasonable contractor/subcontractor base for a period of time pending a later determination of the need for a fifth orbiter.

Question: There seems to be some disagreement within the Administration as to when a fifth orbiter will be needed. What is NASA's position?

Answer: Over the past year, NASA has intensely studied the need for additional orbiters with emphasis on the requirements for a fifth orbiter. This examination focused on impacts of the loss or extended downtime of one of the currently authorized four orbiter fleet and on the likelihood of projections of future growth being realized beyond the capabilities of the four orbiter fleet.

The results of the studies have shown that four orbiters can more than meet the mission manifest requirements for at least the remainder of this decade. However, a theme emerging from the studies was the need for a measure of assurance to accommodate unscheduled maintenance, system upgrades, aborts, and accidents causing extensive damage or loss of an orbiter.

The proposed orbiter structural spares will provide the assurance necessary for the Nation to operate the four orbiter fleet in a robust manner. The FY 1984 budget includes $100 million of a planned total of $420 million for the procurement of orbiter structural spares. These structural and component spares will provide the necessary assurance that Shuttle operations will continue in the face of minor problems, modifications, or other periods of extended orbiter outages.

Another important benefit to procuring the structural spares is the protection of our orbiter production capability. Following delivery of the OV-104 hardware, many structural and component subcontractors would otherwise be closing down their orbiter lines; this action preserves major areas of production capability for an additional one to two years, depending on the element.

Question: What is the current cost of a fifth orbiter and what is the spending profile? Will additional support facilities be needed? Additional personnel?

Answer: An FY 1984 start based on the $100 million requested for structural spares in the FY 1984 Congressional budget would deliver OV-105 in mid-1989 with the following funding profile (Real Year dollars in millions):

FY 1984	FY 1985	FY 1986	FY 1987	FY 1988	FY 1989	TOTAL
100	430	470	435	365	150	1950

The requirement for additional support facilities and personnel is driven by the planned flight rate rather than an additional orbiter. Based on a maximum flight rate of 24 per year, no additional facilities are foreseen if a fifth orbiter is procured. Currently for KSC, the two OPF bays, two vehicle assembly bays, two launch pads and three mobile launcher platforms are in the FY 1984 budget request and are adequate to support the flight rate. If we exceed 24 flights per year it may be necessary to provide additional support facilities at KSC. No additional manufacturing facilities are required to provide a fifth orbiter. A full discussion of the subject is contained in the

National Research Council Report, "Assessment of Constraints on Space Shuttle Launch Rates."

Question: What is current thinking on the possibility of commercializing Shuttle operations?

Answer: Commercializing the overall Shuttle operations in the near term may not be feasible. There are aspects of the Shuttle program which could possibly be transferred to the private sector such as the marketing responsibilities. Consideration of this possibility was made during the initial evaluations of the Space Transportation Company offering to procure a fifth orbiter, and other proposals directly related to marketing. There is, of course, continuing commercial investment in upper stages and payload checkout and integration.

Future Defense Developments

Question: In his March 23 speech, President Reagan discussed a number of possible future defense programs. NASA is, of course, a civilian agency, but have defense proposals been discussed with NASA and could you envision any use of the Shuttle or a space platform, if the directions outlined by the President are pursued?

Answer: Because the space platform is servicable from the Shuttle, it could be used as a means to test subsystems being developed by the Department of Defense. There were discussions with DOD along these lines early in the development of the space platform program.

Question: For the record, please bring us up-to-date on policy relating to DOD reimbursement for use of the Shuttle.

Answer: NASA and the USAF signed a Memorandum of Agreement (MOA) on February 1, 1983, titled "Reimbursement of Launch and Associated Services for Users of the Space Shuttle." A copy has been attached for the record. The DOD will reimburse NASA $16.0 million (FY 1975 dollars) for flights through FY 1985 and $29.8 million (FY 1975 dollars) for flights occurring in FY 1986 through FY 1988. (Enclosure 3)

Launch Tower/Launch Complex 39

Question: I understand that NASA has let a contract to demolish the launch tower located at Launch

Complex 39 at the Kennedy Space Center (KSC). Why is NASA seeking to demolish the tower?

Answer: The removal or demolition of the tower on the last remaining Saturn V/Apollo Launcher Umbilical Tower (LUT) is to provide a base for the third mobile launcher platform (MLP). The third MLP is required to meet the operational launch rate of the Space Shuttle program at KSC which has eighteen planned launches in FY 1987. In order to meet this launch rate the third MLP must be operational in October 1986. To meet this need date, the LUT base must be available for the start of modification by the end of 1983.

During earlier modifications of Launch Complex 39 to support the Space Shuttle, two of the three Saturn V/Apollo LUT's were dismantled to provide the initial two MLP's and fixed service structures at each of the two launch pads.

Question: To whom was the contract let, for what price, and under what conditions? Why was the provision allowing for sale of the scrap included?

Answer: A contract was signed with Best Wrecking Co., Inc. of Detroit, Michigan, for the sum of $574,601. The contract included an option not in the $574,601 value, for preservation of the tower and retention of Government title. The contract instructed Best Wrecking Co., Inc. to submit a proposal for disassembly and preservation of the tower which could be exercised within 60 days of the effective date of the basic contract (February 24).

Since there were no NASA requirements to retain the tower and associated equipment, the invitation for bid instructed the contractor to remove the tower from Government property with any salvage or scrap value being used to offset disassembly and removal costs.

Question: How many bid on the project and what was the range of bids?

Answer: Fifteen bids were received in response to the Invitation For Bid (IFB) for removal and disposal and costs ranged from a low of $574,601 to a high bid of $3,656,580.

Question: What is the so-called "preservation option" and the cost? What options other than demolition did NASA consider? What would be the cost of each?

Answer: The preservation option is the contract option included in the basic contract with Best Wrecking Co. Inc. which called for the contractor to submit a cost estimate providing for tower removal and preservation. The contract specifies that the Government could exercise the preservation option within 60 days of the effective date of the basic contract (February 24). The estimated cost submitted by Best Wrecking Co. Inc. was $2.4 million which is $1.8 million above the basic $574,000 contract cost. An additional 360,000 is to be added to the $1.8 million difference to cover costs for storage, site preparation and tower bracing not included in the Best Wrecking Co. Inc. preservation proposal. An additional 20 percent contingency funding brings the total cost for the preservation option to approximately $2.6 million above the basic $574,000 contract price.

Prior to deciding to dispose of the tower, NASA investigated uses for the tower and equipment. Two of the Apollo swing arms are to be retained for use by the Shuttle program on Launch Pad B. There were no uses or requirements identified for the remaining tower, Saturn 1B pedestal and equipment. The possible reerection of the tower at a visitor site was considered and discussed with the contractor (TWA Services Inc.) currently operating the Visitor Center at the Kennedy Space Center. TWA Services indicated they were not in a position to undertake the cost of reassembly or maintenance of such an exhibit. In addition they indicated that the structure did not lend itself to any conceivable elevator system that could handle the volume of paying visitors necessary for financial support.

The estimated cost of the option that included retention of the tower by the Government for possible use ranged from $2 million to $4 million.

Question: If a permanent injunction is granted, how will NASA respond?

Answer: The Complaint filed by the National Trust for Historic Preservation and other Plaintiffs asks the Court to decree that NASA be enjoined from demolishing or selling the LUT for scrap. It is our understanding that the Plaintiffs do not object to the LUT being dismantled pursuant to the "preservation option." If a permanent injunction (or a temporary injunction that affects the operational schedule for Shuttle) is granted and if NASA does not obtain additional funds from Congress, we will be forced to utilize program funds to exercise the preservation option, i.e., to dismantle the LUT and store it at KSC.

Question: Please explain the basis for the $8 to $10 million estimate of the cost of reassembling the launch umbilical tower (LUT). Has any party expressed interest in reassembling the tower.

Answer: NASA, in conjunction with its assessment of the costs submitted by Best Wrecking Co. Inc. for the preservation option, had its A&E contractor, Reynolds Smith and Hills, prepare an estimate of the cost to reerect the tower at the Visitor Information Center. The estimate considered all the costs necessary to prepare the site and foundation, refurbish, equip and erect the tower at a visitors site with new elevators and a complete set of Apollo/Saturn V swing arms. The estimated cost for this concept including a low cost steel building simulation of the LUT base is $8 million to $10 million and does not include funds for assembly of a Saturn V vehicle alongside.

The only interest expressed regarding the reassembly of the tower has been from construction firms and the disassembly contractor.

Space Platform

Question: What is the current status of your space platform efforts? How much do you expect to spend on this program in FY 1984?

Answer: The space platform Phase B studies were completed last year. These studies brought the project to a state of readiness which would support any future NASA decision to proceed with the execution phase. No money is planned to be expended on space platform in FY 1984. Continuation of platform activities is dependent on definition of the overall space architecture, a task now underway.

Question: If up to $5 million is added by Congress, how would these funds be used?

Answer: Specific technology augmentation and advanced technology development activities related to a potential space station system would be undertaken. Discipline activities could include control and data management, electric power (acquisition, storage, and distribution), thermal management, on-board propulsion, and other areas.

Question: Presumably the United States can either pursue the development of a manned space platform or an unmanned station which might later evolve into a manned one. Has any decision been made as to which route to take?

Answer: No decision has been made concerning the functional capabilities of an initial space station system. We have just received the final reports of the space station mission analysis studies. We will be analyzing these studies and developing integrated and time-phased space station mission requirements over the next several months. The space station architecture which best satisfies these requirements will then be defined. At that point, we will be in a position to recommend the proper evolutionary development path. It is clear, however, that both manned and unmanned elements offer unique benefits in terms of the future utilization of space. Commonality of elements between the two systems will be a key to cost effectiveness.

Question: What is the earliest date at which a manned station would be feasible?

Answer: Current Agency planning is based on a development start in FY 1987 with initial operational capability in 1991.

Delta Expendable Launch Vehicles (ELV's)

Question: NASA wants to phase out expendable launch vehicles. What is your timetable for doing so and what factors drove that decision?

Answer: Expendable launch vehicles under NASA management consist of the Scout, Delta and Atlas Centaur and Atlas-F. These vehicles are planned to be phased out of use after all firm launch commitments, currently under contract, are satisfied. These launch commitments extend into calendar year 1987.

The decisions to phase out expendable launch vehicles are based on a number of factors. The Shuttle is a more versatile and flexible system. It is operated by man, has more redundancy and is more reliable. It can retrieve payloads for inspection and return to earth for repair and reuse. As we gain more operational experience with the Shuttle, the phase out date for expendable launch vehicles in regard to the continuation of their operations by NASA appears reasonable. This does not preclude, of course, the continued operations of these vehicles by non-U.S. Government parties.

Question: By phasing out Deltas, what users would you be forcing onto the Shuttle?

Answer: The Delta launch capability is currently limited to placing a 2,800 pound satellite into a geosynchronous transfer orbit. Many of the previous users of the Delta system have opted for the Shuttle. There are no plans to continue Government operation of the Delta system beyond those users currently on the schedule. This phase out of expendable systems has been planned since the mid-1970's. With the phase out of Government operations, the U.S. Government can accommodate the launch requirements by the Shuttle.

Currently, no users are being forced off of expendable launch vehicles; however, they are being encouraged by NASA to schedule on the Shuttle.

Question: Has the Delta been discussed with DOD and coordinated with plans DOD may have for its ELV's in the future?

Answer: The plans which have been made to phase out the Delta launch vehicle, as well as all NASA expendable launch vehicles, have been coordinated with the DOD. This coordination is expected to continue.

Question: How practical do you view commercialization of ELV's? Under such an arrangement, what would be NASA's role and what that of private entities? Has any consideration been given to what type of pricing policy might be used for such an arrangement?

Answer: NASA has not examined the practicality, in a business sense, of commercial ELV's because we feel that such a determination is more appropriately the responsibility of the various private sector proposers. The most difficult factor in performing such a determination is the determination of a reasonably valid capture ratio of missions from the commercial and foreign market segment.

The commercialization of ELV's appears to be a near-term consideration, in part because of the pending phasing out of production capabilities. We believe the costs associated with the restart of production capabilities after shut-down to be an important factor in the feasibility of the proposals received to date.

Under such an arrangement, NASA's role would be that of providing advice and assistance to the appropriate regulatory agencies and upon request, NASA may provide advice and assistance to the private sector ELV operators. The private sector operators will have complete responsibility for production and launch of the ELV system. In some cases, U.S. Government support at the launch site, especially at Government ranges, may be required.

NASA has considered several alternative pricing arrangements for the use of Government services and facilities which may be required. These alternatives were presented to the Senior Interagency Group (SIG) Working Group which was assigned the task of studying the commercialization of ELV's.

Technology Transfer/Technology Utilization

Question: In the FY 1984 budget, the technology transfer program has been zeroed. What is the reason for this?

Answer: Technology Transfer activities previously conducted within science and applications objectives, dealt largely with the transfer of Landsat analysis techniques to Federal agencies, state and local government, and private sector industries which could benefit from its potential use. In some instances, entities are now beginning to demonstrate an independent capability in the analysis and use of Landsat Multispectral Scanner data, NASA is no longer placing emphasis upon project demonstration activities previously conducted under the Technology Transfer program. However, some of these organizations will continue to be involved with emerging NASA remote sensing technology, such as the Thematic Mapper, through cooperation and future NASA research, test and evaluation programs where appropriate. NASA further intends to continue to support certain technology transfer activities on a reimbursable basis.

Question: If funding in the $4 million range were imposed upon NASA by Congress, how would you use the funds?

Answer: If FY 1984 funding for Technology Utilization is in the $4 million range, as requested, NASA would divide the funds between two sub-program elements: $2.2 million for Technology Dissemination and $1.8 million for Technology Applications. The Technology Dissemination program would place major emphasis on the Tech Brief publication and technical support packages. NASA support of the technology dissemination centers would be significantly reduced and efforts made for centralization and modernization of this network for greater cost effectiveness and efficiency would also be reduced. Program evaluation and support activities would likewise be reduced, but maintained at a minimal level to provide only essential evaluation inputs and support elements to the program as a whole. The Technology Applications program would continue with only one applications team to interact with potential public and private sector users. We would be able to complete and initiate only high priority applications projects in manufacturing productivity, bioengineering and rehabilitation areas.

Question: Your justification notes that "NASA will attempt to maintain price levels for technical information for U.S. industry so that access by small business users will not be seriously impaired." What are current price levels and how are they determined? Do you believe your "attempts" will be successful without downgrading the information provided?

Answer: The primary information products and services most used by small business firms are NASA Tech Briefs, a quarterly new technology announcement journal, and retrospective technical information searches provided by NASA's network of Industrial Applications Centers. Currently the NASA Tech Briefs journal is free to all qualified scientists, engineers and businessmen in U.S. industry, while the price of retrospective searches normally range from $150-$300 each. Search prices depend largely on the complexity of the firm's problem being addressed, and the number of data bases searched.

NASA is currently exploring ways to move toward some form of cost-recovery for the NASA Tech Briefs that would not seriously affect access by small business users. NASA does not anticipate any increase in retrospective search prices at its Industrial Applications Centers. In fact, methods are constantly being pursued to minimize or reduce search costs, in spite of recent increases in data base costs provided by commercial vendors. NASA is very hopeful that these continued efforts will be successful, thereby maintaining an effective array of information products and services that are affordable by small business firms.

AgRISTARS

Question: What was your request to OMB for the AgRISTARS program?

Answer: The FY 1984 budget request to OMB for AgRISTARS activities was $4.0 million.

Question: If $3 to $4 million were authorized and appropriated for the program, how would you utilize those funds?

Answer: NASA believes that the FY 1984 budget request provides a balanced program as presented. NASA has previously expressed its willingness to continue cooperating with the Department of Agriculture in pursuing AgRISTARS objectives on a reimbursable basis. However, if NASA were to receive an FY 1984 appropriation specifically for AgRISTARS, it would be utilized to expand the existing U.S.Government AgRISTARS program by incorporating a broader range of research activities and analyze data from new sensors.

National Space Technology Laboratories

Question: How many persons are currently employed at the National Space Technology Laboratories (NSTL)?

Answer: The on-site workforce at the National Space Technology Laboratory is comprised of NASA civil servants, contractor personnel supporting NASA programs, employees on the direct payrolls of the various tenant agencies, contractors that support the tenant agencies and concessionaries. The table below summarizes the manpower levels at NSTL.

	Manpower Levels
Civil Service	
NASA Civil Service	131
Other Government Agencies:	1,656
Total Civil Service	1,787
Non-Civil Service	
Contractors	1,799
Concessionaires	22
Total Non-Civil Service	1,821
GRAND TOTAL - NSTL POPULATION	3,608

Question: What are the principal facilities--number of buildings, use of each?

Question: What are the principal facilities--number of buildings, use of each?

Answer: A list of all principal facilities at NSTL and primary uses follows:

BUILDING	FACILITY	PRIMARY USE
1000	Data Handling Center	Navy Oceanographic Data Processing
1002	Navy Oceanographic Building	Administration and Engineering
1100	Administration Building	Administration, Headquarters for Resident Federal Agencies
1105	Environmental Laboratory	Multi-Use Laboratory
1110	Data/Engineering Support	Engineering and Data Support
1200	Auditorium Building	Visitors Center, Administration
1201	Communication Building	Communications - Telephone Exchange
1210	Earth Resources Application Building	Earth Resources Application
2101	Hydroscience Center	Engineering, Instrument Calibration and Repair
2105	Engineering & Logistics Building	Engineering, Supply and Warehouse
2201	Repair and Fabrication Shop	Maintenance Shops, Fire Protection and Security
2204	Warehouse Building	Material Storage, Shipping and Receiving
2205	Repair and Fabrication	Maintenance
3302	Space Shuttle Building	Space Shuttle Main Engine Processing and Maintenance

Senator Huddleston—Continued

3203	Oceanographic Building	Ocean Data Buoy Processing and Maintenance
3204	Central Heating Plant	High Temperature Water Generation
3305	Central Compressor Building	High Pressure Gas Supply for Test Areas
4110	Space Shuttle Main Engine Test Control Center	Control of Test Firings
4120	A-1 Space Shuttle Main Engine Test Stand	Static Firing for Shuttle Engine Testing
4122	A-2 Space Shuttle Main Engine Test Stand	Static Firing for Shuttle Engine Testing
4210	Main Propulsion Test Article Test Control Center	Control of Test Firings
4220	Main Propulsion Test Article Test Stand	Static Firing and Propulsion System Testing
4400	HPIW Emergency Power and Heating Plant	High Pressure Industrial Water High Temperature Water and Emergency Power Generation
4995	Data Acquisition Facility	Acquisition of Test Data from Static Firing Test Stands
8100	Instrumentation Laboratory	Office, Laboratories

At NSTL there are a total of 74 permanent and 37 temporary facilities.

Question: What specific functions are being carried out--number of engine test stands, activities of Environmental Research Laboratory?

Answer: The National Space Technology Laboratories (NSTL) has three functions which relate directly to the overall NASA Agency mission. NSTL supports the development of the Space Shuttle Main Engine (SSME) and the Shuttle Main Propulsion system; manages the installation and provides technical and institutional support service to resident agencies; and conducts research and development in the fields of remote sensing, environmental sciences and other selected applications programs.

NSTL is NASA's prime static test facility for large liquid propellant rocket engines and propulsion systems. There are three test stands at NSTL. Two test stands, A_1 and A_2, are available for testing individual liquid rocket engines. The Main Propulsion Test Stand (MPT) is used to test fire the Space Shuttle's three liquid rocket engines in unison. Major support for the engine testing includes operation of test complex support facilities, HP gas generation, propellant systems management and operations and HP water and power generation.

The Earth Resources Laboratory primarily supports the Office of Space Science and Applications in remote sensing technology research and development, sensor and data system development, and technique test and evaluation. The Laboratory performs fundamental research in developing understanding of information in new sensor data and developing advanced processing and analysis techniques. Applied research includes applications of remote sensor data to areas of national concern and developing sensors and data systems to develop and test advanced sensors, and the development of digital image analysis and geographic information systems. Test and evaluation activities include evaluation of remote sensor data information against information requirements of users.

NSTL provides technical and institutional support services to resident agencies which are also called "Tenant Agencies." These services include such items as Financial Management, Purchasing and Contracts, Legal Counsel, Resources Management and Public Affairs.

Question: What contracts have been let from the NSTL--to whom and for what purposes?

Answer: The following active contracts have been let from NSTL:

Contractor	Supplies/Services
Pan Am World Services, Inc. Bay St. Louis, MS	Facility Operating Services

B&W Services, Inc. Bay St. Louis, MS	Custodial Services
Computer Sciences Corporation Falls Church, VA	Technical Support Services
Lockheed Engineering & Management Services Co., Inc. Houston, TX	Technical Support Services for NSTL Earth Resources Laboratory
Delta Industrial HVAC Contractors, Inc. Atlanta, GA	Modification/Replacement of Cooling Towers
George P. Hopkins Inc. Gulfport, MS	Alterations to Lobby and Third Floor of Bldg. 1100
Goodyear Aerospace Corporation Litchfield Park, AZ	Synthetic Aperture Radar Interpretation
VWR Scientific Harahan, LA	Reversal Color Print Processor
Barbay Engineers, Inc. Baton Rouge, LA	A&E Design Modifications for Utility Control System
PCB Pieztronics Depew, NY	Transducers, 12 each
Toshihiko Sakow Associates, Inc. Teaneck, NJ	Design Services for NSTL Visitors Center
WICAT Systems, Inc. Orem, UT	WICAT System 150-6WS
Starks Contracting Co., Inc. Biloxi, MS	Construction of Addition Rehabilitation of Environmental Research Laboratory, Bldg. 2423
Fairley/Virden Fields & Alexander, LTD Jackson, MS	Design of Addition to Engineering Services Bldg. No. 2104
Jaygo, Inc. Hawthorne, NJ	Granulator Assembly Unit

NSTL Construction of Facilities

Question: Some $2.3 million was appropriated in FY 1983 for Construction of Facilities. What was this for? Is construction underway? What is the status?

Answer: The $2.3 million appropriated in FY 1983 for Construction of Facilities was for repair work; rehabilitation and modification work; and minor construction. The repair work included repairs to the cross-country high pressure gas lines; repairs to the diesel engines which drive high pressure gas lines; repairs to the diesel engines which drive high pressure industrial water pumps; repair/replacement of various heating, ventilation and air conditioning components in sixteen buildings; and the repairs of roofs in seven buildings. Presently, repair work is approximately ten percent complete with all work scheduled to be finished by September 1984. The rehabilitation and modification work includes modifications to the heating, ventilation and air conditioning systems in six buildings to improve system efficiencies, and upgrading the oral warning system used during hazardous testing or emergency weather conditions. Approximately five percent of the rehabilitation and modification is underway with completion scheduled for March 1984. The minor construction includes additions to the Earth Resources Laboratory and the Fabrication Shop. These two projects are eight percent complete and are scheduled to be completed by September 1983.

Question: Some $3.4 million is requested for Construction of Facilities in FY 1984. What will these funds be used for?

Answer: The FY 1984 request for approximately $3.4 million in FY 1984 is for similar type work requested in FY 1983, namely, repair, rehabilitation and modification work, and minor construction. The repair work is required to restore facilities or components to a condition substantially equivalent to their original intended or design capability. The rehabilitation and modification work is of such a nature and magnitude that it cannot be accomplished by routine day-to-day maintenance and is also necessary to improve the capabilities and usefulness of facilities. The minor construction work augments the capabilities of existing facilities by providing a small building addition. The FY 1984 request, totaling $3.4 million, includes approximately $1.5 million for repairs; $1.4 million for rehabilitation and modifications; and $0.5 million for minor construction.

NSTL Remote Sensing Activities

Question: Do the remote sensing activities undertaken there relate mainly to Landsat or are other systems also involved? If so, which ones?

Answer: The thrust of the present research at NSTL is the analysis of Landsat Thematic Mapper (TM) and airborne-simulated TM data to determine the improved capabilities over the Multispectral Scanner. Additional research is being conducted with other aircraft and satellite sensors such as the airborne Thermal Infrared Multispectral Scanner operating in the thermal region of the spectrum, and SEASAT, Shuttle Imaging Radar, and aircraft synthetic aperture radars operating in the microwave region.

Tenant Agencies at NSTL

Question: According to your justification, there are "tenant agencies" at NSTL. What are they and why are they there?

Answer: The tenant agencies at NSTL are listed below with a description of their functions:

Department of Commerce

National Oceanic and Atmospheric Administration

NOAA Data Buoy Office

Conducts R&D in the utilization of buoys for the measurement of oceanographic and meteorological parameters.

NOAA/Office of Marine Pollution Assessment

Coordinates and initiates scientific activities addressing regional marine environmental pollution problems in accordance with Federal regulations.

NOAA/National Marine Fisheries Service/ Fisheries Engineering Laboratory

Develops fisheries data collection, analysis and management systems.

Department of Interior

U.S. Geological Survey/Gulf Coast Hydroscience Center

Assesses the effects of natural and manmade conditions on water resources and conducts research in the field of hydrology and related sciences.

U.S. Geological Survey/National Mapping Division Assistance Facility

Provides technical assistance in the use of remote sensing data to address natural and environmental problems.

U.S. Geological Surver/National Cartographic Information Center

Provides the public with current information on cartographic products including topographic maps, orthophotographs, digital terrain tapes and space photography.

U.S. Fish & Wildlife Service/Ecological Services Field Station

Determines the optimum mix of developmental and recreational use of land and water areas and the preservation of fish and wildlife resources.

Environmental Protection Agency

Environmental Protection Agency/Toxicant Analysis Center

Develops techniques for recognizing and determining pesticide content in soils, crops, and wildlife and other samples.

Department of Transportation

U.S. Coast Guard/National Strike Force

Coordinates activities in the containment, cleanup and disposal of hazardous substances discharged into southern waterways.

Department of Defense

U.S. Navy/Naval Ocean Research and Development Activity

Manages a broadly based RDT&E program in ocean science and technology with emphasis on understanding ocean processes through measurements and analysis, and the effects of the ocean environment on Navy systems and operations.

U.S. Navy/Commander Naval Oceanography Command

Manages assigned oceanographic, mapping, charting, and geodetic data and meteorological activities and efforts under the naval oceanographic program. Provides technical guidance in such matters throughout the Department of the Navy.

U.S. Navy/Naval Oceanographic Office

Collects, analyzes and displays oceanographic data to support naval operations and naval shore establishment commands; improves methods of oceanographic predictions, data collection and data analysis; and assists other DOD components, U.S. activities and allied countries in training and in otherwise meeting their oceanographic requirements.

U.S. Army/Mississippi Army Ammunition Plant

Manufactures improved 155mm artillery ammunition through use of the latest state-of-the art, semi-automated manufacturing methods.

ARRADCOM Resident Operations Office

Conducts research and development testing of explosive-type materials to improve safety in handling, transportation and storage.

State of Louisiana

Louisiana Technology Transfer Office

Obtains Federal assistance and exploits available technology to resolve state problems.

Universities and Colleges

Mississippi State University

- NSTL Research Station

  Conducts studies to define region in ecological terms, conducts studies on pollution effects to simulated salt water ecosystems.

- Liaison Office for coordinating workshops and academic training at NSTL.

The operation of NSTL for NASA programs requires a management and administrative framework of functions which are then available to other resident agencies on a cooperative basis. This framework of functions includes: financial management, purchasing and contracts, administrative services, legal counsel, resources management and public affairs. NSTL also provides technical and institutional services through the management of cost centers established on a reimbursement principle.

NSTL R&D Budget

Question: The R&D budget for NSTL is scheduled to drop to $13.1 million in FY 1984 from $24.4 million in FY 1983. What accounts for this dramatic decrease?

Answer: The reduction in the R&D budget can be solely attributed to the planned completion of the Main Propulsion Test (MPT) program. The budget to Congress provided for the last of a series of static firings in May 1983 to complete the MPT test program. This last test would have been a full duration and full power level through engine test. Since the budget was formulated last fall, the engines that would have been used for the MPT firing were reallocated for use by the Challenger prior to its initial flight. The MPT program is currently under evaluation and a decision will be made later this summer about the levels of FY 1984 R&D funding that may be required for NSTL.

Enclosure 1

Country/Mission	Description	Level of Effort	Status	Related NASA Programs/Comments
ESA/Microwave Remote Sensing Experiment	Combination of synthetic aperture radar, two-frequency scatterometer and passive microwave radiometer for measurement of naturally-emitted microwave energy from earth.		Experiment planned for 1st Spacelab payload - 1983; possible reflights.	NASA also engaged in microwave remote sensing R&D. NASA discussing with Germany the possible inegration of the MRSE instrument into a future NASA Shuttle payload.
Germany/MOMS	Modular Opto-electrical Multispectral Scanner--Two-channel visible and near-infrared instrument with 20 meter resolution.	Estimated $30M per flight	Two-channel version will fly on STS-7 in Spring 1983 as part of German-built Shuttle Pallet Satellite payload.	Sophisticated instrumentation of potential interest to U.S. Germany has indicated interest in remote sensing cooperation.
India/IRS	Indian Remote Sensing Satellite; Two sets of CCD cameras, each with four spectral bands.		Work on spacecraft and subsystems has begun; planned 1986 launch.	Likely less sophisticated Landsat-type mission.
Canada/Radarsat	Synthetic aperture radar with on-board data processor.	$114 M Canadian budgeted for 5-year development program.	Definition study phase. Phase B to start in 1984 with planned 1990 launch.	Cooperative discussions with NASA already underway; possibility of NASA instrument.
Brazil/Remote Sensing Satellites	Cameras will use CCD detectors; images to be produced in four channels with near 50 meter resolution.		Under study; launch planned for 1987-1990 timeframe.	Landsat-type mission; possibility of pre-flight of Brazilian sensor on NASA Shuttle payload.

Country/Mission	Description	Level of Effort	Status	Related NASA Programs/Comments
Japan/ERS-1	Polar orbiting, sun-synchronous Earth Resources Satellite; under consideration are infrared and optical radiometers with stereo camera capability; synthetic aperture radar.		Definition study phase; sensors not yet finalized; estimated 1989 launch.	Could provide competition to Landsat-D and SPOT. U.S. geological users will probably be interested in data.
ESA/ERS-2	Advanced Earth Resources Satellite; Multilinear array solid state sensor and synthetic aperture radar under consideration.		Under study; launch would be near end of decade.	If developed, will likely utilize next-generation MLA technology. NASA R&D in this area is underway with no specific plans for mission.
ESA/Metric Camera	High resolution photography aerial survey camera; resolution in 10-20 meter range.		Experiment planned for 1st Spacelab payload - 1983; possible reflights.	Less sophisticated than NASA's Large Format Camera. ESA interest in Metric Camera reflight opportunities more properly in domain of industry or USGS.
Japan/ERS-1	Polar orbiting, sun-synchronous Earth Resources Satellite; under consideration are infrared and optical radiometers with stereo camera capability; synthetic aperture radar.		Definition study phase; sensors not yet finalized; estimated 1989 launch.	Could provide competition to Landsat-D and SPOT. U.S. geological users will probably be interested in data.

Country/Mission	Description	Level of Effort	Status	Related NASA Programs/Comments
ESA/ERS-2	Advanced Earth Resources Satellite; Multilinear array solid state sensor and synthetic aperture radar under consideration.		Under study; launch would be near end of decade.	If developed, will likely utilize next-generation MLA technology. NASA R&D in this area is underway with no specific plans for mission.
USSR/(MKF-6m camera is East German)	Flying mechancial multispectral scanners and MKF-6m multispectral camera on "Meteor" series of meteorological satellites and on other manned unmanned missions.		Ongoing	Soviets have recently placed greater emphasis on earth resources remote sensing and may well provide greater competition in future.
ESA/Metric Camera	High resolution photography aerial survey camera; resolution in 10-20 meter range.		Experiment planned for 1st Spacelab payload - 1983; possible reflights.	Less sophisticated than NASA's Large Format Camera. ESA interest in Metric Camera reflight opportunities more properly in domain of industry or USGS.

FOREIGN REMOTE SENSING CAPABILITIES

Country/Mission	Description	Level of Effort	Status	Related NASA Programs/Comments
France/SPOT-1 SPOT-2	Polar orbiting, sun-synchronous land remote sensing satellites employing two pointable 10 meter resolution, capability of obtaining limited cross-track stereo data.	$300 M - SPOT-1 $100 M - each subsequent mission	SPOT-1 under construction; planned late 1984 launch; SPOT-2 under construction--planned 1986 launch; follow-on satellites planned.	Expected strong competition to Landsat-D system for data market and associated hardware market.
Japan/MOS-1	Polar orbiting, sun-synchronous Marine Observations Satellite; scanning and infrared radiometers; 50 meter spatial resolution.	$200M	Under construction; planned 1986 launch; possible follow-ons.	With early failure of Seasat and demise of NOSS, MOS-1 will likely be next ocean-oriented satellite in orbit. NASA might explore data acquisition.
ESA/ERS-1	Coastal Ocean Monitoring Satellite with synthetic aperture radar, wind scatterometer, radar altimeter, and along track scanning radiometer.	Estimate of 450-500M MAU for full instrument complement; 400 MAU ($485M) likely allowed limit	Phase-B underway; planned end of 1987 launch.	As with MOS-1, there is possibility for U.S. cooperation with ESA on ERS-1.

QUESTIONS SUBMITTED BY SENATOR DOMENICI

Space Science

Question: There has been considerable concern during the past couple of years about the decline of the space science program in NASA, particularly the planetary program and the trend of support for these programs in the future. Does the FY 1984 budget address these concerns? What is envisioned for the future with respect to the planetary program?

Answer: The concern about the decline of NASA's solar system exploration program prompted NASA, in 1980, to establish the Solar System Exploration Committee (SSEC), an ad hoc committee of the NASA Advisory Council. The aims of the SSEC were to review the goals of solar system exploration, to identify activities which could be undertaken in a lower cost mode than past missions, and to define ways to reduce the cost of planetary missions. The SSEC now has presented a plan for a lower cost planetary exploration program. The FY 1984 budget is directly responsive to one of the recommendations of the SSEC, a start of the Venus Radar Mapper mission. This is the first of a recommended sequence of four missions that initiates a core program of planetary exploration. Implementation of other aspects of the recommendations--establishment of a Planetary Observer Program; development of a simple, modular spacecraft for future planetary missions; and strengthening of the planetary research and analysis program.

Question: I understand that there are serious funding problems in the Space Telescope program that affect the FY 1983 and FY 1984 budgets and increase the runout cost in the range of $200 million. Could you address how NASA intends to accommodate this increase and what the impact might be on other space science programs?

Answer: The current NASA approach to cover the additional Space Telescope funding requirement in FY 1983 is to transfer $15.4 million from within Physics and Astronomy; $3.3 million from Space Applications; and $26 million from Space Transportation Operations. The specific areas where funding would be provided from within Physics and Astronomy is Missions Operations and Data Analysis, specifically from Space Telescope operations and maintenance/refurbishment ($12.0 million) which will stretchout these activities consistent with the Space Telescope development stretchout; and $1.4 million will be transferred from Explorer Operations which will add only a minor risk to performing the planned FY 1983 Explorer Operations activities. In addition, $2.0 million will be transferred from Spacelab Payload Development and Mission Management, specifically by stretching out the Solar Optical Telescope development activities, and $0.3 million will be made available from Research and Analysis. The $3.3 million from Space Applications will be made available from the Landsat-D prime activities. The planned reprogramming of $26 million from Space Transportation Operations will be made available from the planned $34.5 million deferral of Shuttle Operations funding. Use of the planned deferral funding will reduce flexibility in responding to FY 1984 transportation operations program requirements; however, we believe this reduced flexibility is acceptable.

The Administration has not yet determined how it will make the additional FY 1983 and FY 1984 funding requirements for Space Telescope available as of this time. We will inform the Committee as soon as we have reached a recommended position on this matter.

It is NASA's intent not to impact other space science projects anymore than is absolutely necessary.

Space Technology

Question: We hear a lot about increasing competition in the international aerospace market. What do you view NASA's role to be in helping to maintain a U.S. leadership position?

Answer: In Aeronautics, international competition has indeed become a matter of serious concern. The problem is complex, involving a variety of economic and political considerations being addressed by the U.S. Trade Representatives, the Department of Commerce, and other Government agencies as well as by the private sector. One problem, however, directly concerns NASA. Continuing technology advancement is a major factor in international aeronautical competition, and the new foreign aircraft (such as the Airbus transports) are very high quality products -- in part because government ownership and support enables the foreign manufacturers to incorporate high-risk technology which can offset a major advantage U.S. products have had in the past. NASA has a primary responsibility for the development of technology which enables U.S. industry and the DOD to develop superior civil and military aircraft. We have proposed a FY 1984 program which addresses the research and technology issues we believe are critical to the maintenance of technical superiority in both the near and farther future. In planning these programs, we have paid careful heed to the industry, DOD, and university members of our advisory committee structure who are particularly concerned about the technology aspects of international competition.

In response to recommendations by the Office of Science and Technology Policy, we are also currently reviewing our procedures for the unrestricted publication of technical data and for the acquisition and analysis of unclassified foreign technology information.

In Space, international competition in launch vehicles and spacecraft is accelerating as the market expands at an intense rate. Currently our Nation's space industry is recognized for its technical excellence and product performance. However, erosion of our position has started and is more seriously threatened by substantial foreign space technology investments. NASA's contribution to our Nation's effort to remain competitive is to continue to support high-leverage and high-risk technology that commercial users and/or the aerospace industry would not otherwise be able to undertake on its own. The long-lead time from research to practical application is costly and the return on investment for research by individual manufacturers precludes such commitments. We are continually advised by industry, university and other Government advisers to substantially increase our level of technology support. A study conducted by a special committee of the Aeronautics and Space Engineering Board of the National Research Council addressed precisely this issue and their report is currently being written. This committee of executives from aerospace, commercial, and military sectors will provide NASA with specific recommendations concerning high priority technology areas requiring increased emphasis.

Question: What is NASA doing to encourage the commercialization of space technology?

Answer: NASA published guidelines regarding early usage of space for industrial purposes in June 1979. These guidelines state that NASA is prepared to engage in joint arrangements with U.S. domestic concerns in (1) research programs directed to the development of enhancement of U.S. commercial leadership utilizing the space environment, (2) research programs having as an end objective the enhancement of U.S. capability by developing space-related high-risk or long-lead-time technology, and (3) transactions designed to encourage the commercial availability of products of NASA space flight systems.

These guidelines state that NASA incentives for these purposes may include in addition to making available the results of NASA research: (1) providing flight time on the STS on appropriate terms and conditions as determined by the Administrator, (2) providing technical advice, consultation, data, equipment, and facilities to participating organizations, and (3) entering into joint research and demonstration programs where each party funds its own participation.

In our space station planning activities, we are currently negotiating two contracts directed toward commercial users development of a potential future space station. The contractors will continue communicating with interested commercial interests identified during recent mission analysis activities and also study alternative approaches for continuing commercial user development.

Question: This Administration has placed an emphasis on attaining greater financial contribution in technology demonstration programs. Could you please elaborate on the success you have had in achieving this?

Answer: NASA has all but eliminated its Technology Utilization demonstration projects. When there is such a project, it is usually more than 70 percent funded by the potential user agency or industry. In applications engineering, NASA funds as little as possible (usually one-third the cost to demonstrate the technology to the user). The best example is the current cost to transfer aerospace technology for the Programmable Implantable Medication System (PIMS). Over a period of three and a half years, NASA has expended a total of $1.5 million, while industry has expended over $18 million on the PIMS project and will expend approximately another $18 million prior to commercialization. In the same project, NIH has, also, contributed an additional $2.4 million for clinical evaluations of the PIMS.

Space Station

Question: If you are successful in gaining Presidential support for a space station, what will be the impact on the NASA budget? Will you be able to undertake such a program within the current budget level?

Answer: The impact of any space station decision on the NASA budget cannot be fully determined at this time because it depends on several major factors: The ability of NASA to control costs of ongoing projects; the ability to reduce Shuttle development and operations costs; the nature, magnitude, and timing of other possible "new starts"; and, of course, the ultimate total scope of any space station project.

Question: The FY 1984 budget makes specific assumptions regarding Shuttle reimbursements in that year and beyond. Please describe what these assumptions are and outline each year's estimates?

Answer: The FY 1984 budget estimate for Shuttle reimbursements are as follows (real year dollars in millions):

FY 1984	FY 1985	FY 1986	FY 1987	FY 1988
264	600	902	769	$1,459

The above values represent Shuttle reimbursement estimates of anticipated revenue from: foreign, commercial, civil U.S. Government and Department of Defense customers. The estimates for FY 1986 through 1988 are dependent on the actual flight demand. They are close to the maximum reimbursable potential for these years. It is important to note that there is no discount for DOD transfer payments, but a modest (20 percent) adjustment is included for the possible loss or delay of foreign and commercial payloads because of market conditions. The specific pricing assumptions incorporated for dedicated flights are as follows:

	Through FY 1985	
	FY 1975 $	RY $
	($ in millions)	
Standard Services		
Operations Charge	18.0	----
(DOD Additive)	(16.0)	----
Reflight Insurance	(0.3)	----
Use Fee	----	4.3

	FY 1986 and Subsequent FY 1975 dollars only
Operations Charge	38.0
(DOD Additive)	(29.8)
Reflight Insurance	(Included Above)
Use Fee	

Question: There has been considerable attention paid to the proposal of letting industry "buy their own orbiter" for their own use. How viable is this proposal? Why? Why not?

Answer: NASA has had several discussions with the Space Transportation Company, Inc. (SPACETRANS), regarding their stated interest in funding the procurement of an orbiter in return for certain marketing rights to the space transportation system (STS) fleet. SPACETRANS has not submitted a formal proposal to NASA in this regard nor have any negotiations been conducted between SPACETRANS and NASA officials. Should SPACETRANS submit a formal proposal to NASA, it will receive proper attention and will be evaluated on its merits. There is no reason why, under the appropriate terms and conditions, private ownership of an orbiter would not be viable.

Question: Recent delays for Challenger's first launch will undoubtedly result in increased costs. What are those costs? How will they be accommodated in the current and FY 1984 budgets? Will other NASA programs need to be cutback to accommodate the costs?

Answer: The delay in Challenger's first launch has caused some downstream cost and schedule impacts. The cost to conduct the second flight readiness firing and the increased overtime to get the Shuttle back on schedule by the end of this fiscal year was estimated to result in an additional cost of approximately $5 million at the Kennedy Space Center (KSC) and an estimated $1 million at the Johnson Space Center (JSC) for added engineering and analytical integration costs. These estimates have been revised based on incorporating the detailed work schedules and overtime requirements of the KSC contractors; the KSC cost estimate has accordingly been reduced to $2 million. In addition to the KSC and JSC impacts, the effort to remove, disassemble, repair, reassemble and retest the main engines is estimated to cost about $2.5 million in FY 1983 and $1.5 million in FY 1984.

These additional costs will be covered through the reallocation of program reserves set aside for such problems. Other NASA programs will not have to be cut back as a result of the delay.

International

Question: What, if any, have been the international ramifications of decisions made over the past two years to withdraw U.S. support for the International Solar Polar Mission (ISPM), Spacelab and other internationally cooperative efforts?

Answer: It has been the U.S. policy to pursue international cooperation in space activities since

NASA was established in 1958, and this policy was recently reaffirmed.

The President's national space policy directive issued on July 4, 1982, includes as basic goals of our space policy to "promote international cooperative activities in the national interest" and to "cooperate with other Nations in maintaining the freedom of space for activities which enhance the security and welfare of mankind." Consistent with this policy, NASA is continuing to actively pursue cooperative agreements; for example, we are undertaking joint projects with Germany for the Active Magnetospheric Particle Tracer (AMPTE) and Roentges Satellite (ROSAT), and are currently negotiating with Italy on a cooperative Tethered Satellite. Thus, Europe and the United States are actively pursuing cooperative space activities.

However, there are some lessons that both the United States and Europe have learned from ISPM. For example, both the United States and Europe now better understand the respective funding situations -- ESA's programs are approved for their full duration within agreed funding envelopes, and although ESA has always known NASA's commitments are subject to its annual budget process, that had not previously been fully appreciated by ESA. Another lesson is the importance to both sides of being able to consult as early and as fully as possible when faced with critical funding situations, such as the one that resulted in cancellation of the U.S. spacecraft for ISPM. We are frequently reminded of ISPM in our discussions with ESA and other foreign partners.

With respect to Spacelab, there has been no "withdrawal of support" by NASA for this cooperative project. Europe has delivered the first Spacelab flight unit, and we are proceeding with our commitment to buy a second flight unit from Europe. NASA and ESA are working very closely together on planning the first flight of the Spacelab on a joint basis and are addressing problems as they arise.

Question: Has there been any attempt on NASA's part to assess the impact of Ariane available on the currently projected Shuttle manifest?

Answer: In the development of the Shuttle flight schedule, flexibility was provided during the FY 1984 through FY 1985 time frame by utilizing reflight opportunities and existing payload opportunities so that payloads currently scheduled on Ariane could be accommodated on Shuttle should Ariane availability become a problem. In the long term projected flight model, the projected NASA mission model does not assume that many of the ESA-sponsored communication satellites will use the Shuttle. The model does, however, include the next generation of Intelsat satellites and some domestic communication satellites of ESA member nations that have indicated interest in Shuttle flights, and those payloads that require the unique Shuttle capabilities.

QUESTION SUBMITTED BY SENATOR JACKSON

747 Shuttle Carrier

Question: Does NASA have any plans for a second Shuttle carrier airplane? If so, will it be a 747 and when would you plan to have it available to carry the Shuttle? Would these Shuttle carrier airplanes have any other productive use when not airlifting the Shuttles?

Answer: Plans are being jointly discussed with the Air Force to modify one of the Air Force/Air National Guard wide-bodied cargo aircraft as a backup Shuttle carrier airplane. NASA does not plan to purchase another 747 as a backup Shuttle carrier airplane if the Air Force aircraft is not available.

The current discussions with the Air Force have indicated that the Air Force/Air National Guard aircraft would be a 747-200 model. The availability date for its use as a Shuttle carrier airplane will depend on the timing of the necessary modifications, subject to making funds available for this work since NASA did not include funding for this purpose in the FY 1984 budget.

Yes, the Shuttle carrier airplane would be available for other aerospace cargo transportation both external and internal to the aircraft. Joint discussions with the Air Force include reviews of possible future needs for the development of an external canister for transporting large space transportation system cargoes. The canister would be the equivalent of a Shuttle bay carried on the Shuttle carrier airplane by identical interface mounting. Other aerospace hardware that could be accommodated to the same mounting points would also be candidates for this airlift mode.

SUBCOMMITTEE RECESS

Senator GARN. The subcommittee will stand in recess until Thursday, April 28, 1983 at 10 a.m. when the Federal Emergency Management Agency and the Neighborhood Reinvestment Corporation will appear regarding their fiscal year 1984 budget requests.

[Whereupon, at 11:45 a.m. Thursday, April 21, the subcommittee was recessed to reconvene at 10 a.m. Thursday, April 28.]

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT-INDEPENDENT AGENCIES APPROPRIATIONS FOR FISCAL YEAR 1984

THURSDAY, APRIL 28, 1983

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, D.C.

The subcommittee met at 12 noon in room SD–124, Dirksen Senate Office Building, Hon. Jake Garn (chairman) presiding.

Present: Senators Garn and Huddleston.

FEDERAL EMERGENCY MANAGEMENT AGENCY

STATEMENT OF LOUIS O. GIUFFRIDA, DIRECTOR

ACCOMPANIED BY:
- JEFFREY S. BRAGG, EXECUTIVE DEPUTY DIRECTOR, FEDERAL INSURANCE ADMINISTRATOR
- WILLIAM F. WILLIAMS, DIRECTOR, EMERGENCY OPERATIONS
- FRED J. VILLELLA, ASSOCIATE DIRECTOR FOR TRAINING AND FIRE PROGRAMS
- BERNARD A. MAGUIRE, ASSOCIATE DIRECTOR FOR NATIONAL PREPAREDNESS PROGRAMS
- DAVE McLOUGHLIN, DEPUTY ASSOCIATE DIRECTOR FOR STATE AND LOCAL PROGRAMS AND SUPPORT
- JAMES J. RITA, BUDGET OFFICER
- GEORGE JETT, GENERAL COUNSEL

OPENING REMARKS

Senator GARN. The subcommittee will come to order.

We appreciate your willingness to change times from 10 to 12. Often my two hats as chairman of the Banking Committee and chairman of this subcommittee get mixed up, and certainly today was one of those. All we were dealing with—and I have been in a markup since 9 o'clock—is an $8.4 billion increase in the quota for the International Monetary Fund reauthorization for 6 years and the Ex-Im Bank. Otherwise, I didn't have anything to do. So if I start talking about Ex-Im and IMF, you understand I haven't changed the gears yet.

The Federal Emergency Management Agency was created in 1979 as an independent agency pursuant to Executive Order 12127. The plan called for the consolidation of five agencies and several Federal emergency mitigation, response, and disaster programs into FEMA. Later that year, the programs and authorities relating to civil defense, Federal disaster assistance, and Federal preparedness activities were also transferred to FEMA.

FEMA is responsible for supervising Federal efforts to anticipate, prepare for, and respond to major civil emergencies. The Agency also works to insure the effectiveness of the national civil defense program as well as the availability of civil defense systems and resources in coping with all major disasters. FEMA coordinates the programs aimed at preventing and mitigating the effects of potential disasters and the programs designed to deal with these disasters once they occur.

BUDGET REQUEST

This year FEMA is requesting $185,100,000 for emergency planning and assistance, $209,716,000 for State and local assistance, $37,521,000 for the national flood insurance fund, and $127,591,000 for salaries and expenses. This represents a 22-percent increase from the fiscal year 1983 level for these accounts.

PREPARED STATEMENT

We do have another agency that will be appearing this afternoon, so we would hope you could summarize your remarks. We will place the full statement in the record.

[The statement follows:]

STATEMENT OF LOUIS O. GIUFFRIDA

We appear before you today to present testimony on the budget request of the Federal Emergency Management Agency for fiscal year 1984.

Our total request is for $559,928,000 in appropriations, $768,158,000 in outlays and 2,716 in full-time equivalents. Compared to 1983, appropriations decrease by $30,774,000, outlays increase by $102,201,000, and full-time equivalents are increased by 296. The specifics of these changes are detailed in the Budget Justification. My statement will address several of the most significant issues presented in our budget request.

Integrated Emergency Management System

In 1984, we will be fully into our Integrated Emergency Management System (IEMS). This strategy has been presented, discussed at length and is well received by the Defense Department, other leaders in the Administration and with State, local, private sector, and volunteer agency representatives.

The IEMS approach is based upon the premise that there are common functions required before and after all emergency situations to protect the health and safety of citizens. Clearly, this strategy is consistent with the Civil Defense Act, particularly its most recent changes, with other authorizing legislation, and with the Agency's overall mission, as established by reorganization plan and executive orders. The common functions include: mitigation, planning, preparedness, warning, communication, direction and control, shelter, movement of people, and provision of food, health and medical resources.

Placing our priorities on these commonalities and establishing capabilities to deal with these requirements, will provide a basic infrastructure and a foundation on which to build special capabilities to deal with the unique requirements of individual types of emergencies. Taken into account, of course, will be the variation in the scope, duration, speed of onset, and potential damage which characterize the range of emergencies we face as a nation.

1983 is a transition year. We are developing detailed guidance to put our new and more effective approach into full operation in 1984. The integrated approach is designed to:

- Meet the President's civil defense objectives as set forth in the 1982 National Security Decision Directive and the congressional objectives set forth in the 1980 and 1981 amendments to the Federal Civil Defense Act.
- Foster a full Federal, State, and local government partnership with provisions for flexibility at the several levels of government for achieving common emergency goals.
- Emphasize implementation of emergency management measures which are known to be effective.
- Achieve full integration of emergency management planning into mainstream State and local policy-making and operational systems.
- Build on the foundation of existing emergency management plans, systems, and capabilities to broaden their applicability to the full spectrum of emergencies.

The process by which the integrated approach to emergency management will work at the community level is important. A community which has, to this point, done little toward developing emergency management activities will begin a process to develop its emergency plans, governed by national criteria which are specific enough to provide guidance but sufficiently general to allow flexibility in developing plans for the local protection options they believe are most critical.

The process begins with a comprehensive hazard assessment prepared by the community, in conjunction with State personnel and support from Federal regional personnel. It then proceeds through an analysis of capability (identifying shortfalls of resources), and moves to the development of a plan with annexes for the unique aspects of individual emergencies, the maintenance of capability, mitigation activities, emergency operations, and evaluation of such operations.

The jurisdiction will then be asked to prepare a multi-year development plan, followed by annual plan increments as the process proceeds. By following this process, a community can establish an Integrated Emergency Management System, with readiness to deal with both the common elements of preparedness and those requirements which are unique to individual emergencies. In jurisdictions which have already developed their planning process more fully, a number of the steps in this process may only need review or updating.

In implementing the Integrated Emergency Management System FEMA will capitalize upon the substantial body of experience in emergency management as well as the vast amount of in-place resources in communities throughout our Nation.

CIVIL DEFENSE

Our request for the Civil Defense Program in 1984 is $253,517,000 and 745 full-time equivalents, an increase of $105,668,000 and 84 full-time equivalents over the current year. At first glance, this may appear to be a restatement of our 1983 request. I assure you this is not the case.

We need the full $253.5 million requested for the Civil Defense Program to begin orderly deployment of the Integrated Emergency Management System (IEMS) that is mandated by our mission. The Civil Defense resources which exist at State and local levels of government constitute a major portion of the foundation upon which IEMS will proceed to build a truly comprehensive emergency management capability. The funding levels of the past decade have sustained an organization, but have provided only marginal capabilities to protect life and property in civil defense emergencies of all types.

FLOOD PLAIN MANAGEMENT

The request for the Flood Plain Management program, authorized in the National Flood Insurance Act, is $65,780,000 and 214 full time equivalents, an increase of $5,179,000 over the current year. This activity involves the operation of a program that combines mapping, regulatory, and technical assistance efforts for responding to known flood hazards and mitigating their effects through a comprehensive approach to the management of flood plains.

The $5,179,000 increase will enable us to put increased emphasis on completing the required flood studies by the proposed 1987 deadline, initiate 5 special studies on technical problems connected with specific natural hazards, and to provide technical assistance to local officials in applying the results of the flood studies in the management of their flood prone areas. It will also enable us to initiate restudies, evalute official appeals of Flood Hazard Boundary and Flood Insurance Rate Maps and increase monitoring of local flood plain management enforcement activities.

FIRE PREVENTION AND CONTROL

This budget request provides funding for the United States Fire Administration and its fire prevention and control programs at basically the same level as 1983; $4,185,000 and 20 full-time equivalents. This funding will maintain a Federal fire focus to support the efforts of the Nation's fire and related services. Emphasis will be placed on the continuation and improvement of such programs as national fire data and analysis; fire prevention and arson control; firefighter health and safety; as well as, fire service and rescue management.

TRAINING AND EDUCATION

In the Training and Education area, we are requesting $12,250,000 and 80 full-time equivalents, an increase of $1,317,000 over the current year. The program prepares Federal, State, and local officials to meet the responsibilities and challenges of a full spectrum of domestic emergencies through training in such areas as hazard mitigation, emergency prepardness, fire preventon and control and disaster response through courses offered at the National Emergency Training Center in Emmitsburg, Maryland and throughout the country in State and local training activities. The requested increase is to provide for essential fire and life safety improvements at the Training Center site.

COMPREHENSIVE EMERGENCY PREPAREDNESS PLANNING

The 1984 request for Comprehensive Emergency Preparedness Planning is $6,974,000 and 48 full-time equivalents, an increase of $632,000 over the current year. These funds provide FEMA's planning and preparedness support to State and local government in the area of natural and technological hazards, including earthquake hazards reduction, hurricane preparedness planning, hazardous materials incidents, dam safety, and hazard mitigation assistance.

The requested increase will be allocated to the Earthquake Program to strengthen our lead role in earthquake preparedness, continue cooperative planning projects with the private sector, encourage adoption of improved seismic safety provisions, and develop with the Building Seismic Safety Council a policy and technical approach for abatement of hazardous buildings in the public and private sectors.

RADIOLOGICAL EMERGENCY PREPAREDNESS

The request for Radiological Emergency Preparedness is $6,025,000 and 67 full-time equivalents. For 1984 we are requesting downward adjustments to certain elements within the program to offset an increase of $547,000 for the Commercial Nuclear Power Plants Facilities element. This adjustment will allow us to test and evaluate the Federal response plan for commercial nuclear power facility accidents; continue to upgrade uniformity of Radiological Emergency Plans and Exercises; and to test alert and notification systems for approximately 33 sites.

FEDERAL PREPAREDNESS

For Federal Preparedness, we are requesting $131,878,000 and 898 full-time equivalents, a net decrease of $13,247,000 in budget authority and an increase of 212 full-time equivalents. The purpose of this program is to ensure that the Nation will be able to respond to, manage, and recover from national security emergencies and to enable government, at all levels, to cope with the consequences of accidental, natural, and man-made occurrences. These goals are being achieved by directing and

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INSTRUCTIONS
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guiding emergency planning activities and conducting programs assigned to FEMA in such areas as Government Preparedness, Resources Preparedness, Mobilization Preparedness, and Federal Preparedness Policy and Planning.

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DISASTER RELIEF

Under the Disaster Relief Act of 1974, FEMA is authorized to administer disaster assistance programs, and to manage and coordinate the total Federal response to Presidentially declared disasters. For 1984 no new budget authority is being requested because the unobligated balances in the account appear sufficient for the upcoming fiscal year.

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NATIONAL INSURANCE DEVELOPMENT FUND

The National Insurance Development Fund supports two programs: Riot Reinsurance and Federal Crime Insurance. For 1984, $17,077,000 is anticipated in borrowing authority.

The Administration is recommending that each of these programs be terminated at the end of fiscal year 1983. There are numerous reasons for the termination of these two programs. The riot reinsurance program has only 11 contracts reinsuring 16 companies. We have no doubts that these few companies could find reinsurance protection in the private sector.

The crime insurance program never reached the potential anticipated when it was begun. With less than 58,000 policies in force today, the program is losing about 1,000 policies per month. This is an indication that policyholders are able, for the most part, to find coverage in the private market. In New York, for example, where 60% of the policyholders reside, we are working with the state to provide alternatives to Federal crime insurance.

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NATIONAL FLOOD INSURANCE FUND

For 1984 FEMA is requesting an appropriation of $37,521,000 for the National Flood Insurance Fund to be used to repay borrowings against the $1 billion borrowing authority. This represents a decrease of $1,638,000 from the amount appropriated in 1983. Our objectives are to make this program self-supporting by 1988, to operate the program on a more business-like basis while encouraging prudent decisions regarding areas affected by the flood hazard, and to increase insurance industry involvement in the program.

SALARIES AND EXPENSES

The 1984 request for Salaries and Expenses is $127,591,000 and 2,709 full-time equivalents, an increase of $14,646,000 and 296 full-time equivalents over the current year. This appropriation provides the salary and other costs required to provide executive direction, administration, and staff support to FEMA's programs in the headquarters office and field offices.

The $14,646,000 increase will provide full-year funding of the October 1982 general pay raise, the December 1982 Executive pay raise, Medicare Hospital Insurance costs effective January 1, 1983, and funding for 296 new full-time equivalents requested for activities in Civil Defense and Federal Preparedness.

In summary, Mr. Chairman, the request before the Committee will support the President's commitment to improve the country's Emergency Preparedness and National Security posture. It continues and in some cases enhances Federal programs which contribute to emergency preparedness and life safety throughout the Nation. And, it proposes the elimination of programs which we believe can best be handled in other ways.

Thank you, Mr. Chairman. My staff and I will be pleased to answer any questions you or other members of the Subcommittee may have.

UTAH EARTHSLIDE

Senator GARN. Before we get to your testimony, let me thank you at this point, Mr. Giuffrida, for your cooperation and response, and FEMA's response, to the very urgent slide situation in Thistle. Members of my staff have indicated to me that FEMA officials here in Washington, at the disaster scene in Utah, as well as your Denver office, have been very, very cooperative.

But let me express, as I am sure you have heard the details from your staff, last Saturday I went out to the slide area. I had read your reports, reports from the Governor, as well as a lot of newspaper accounts, and had all sorts of information feeding into me. This particular canyon is one that I know very well. A lot of canyons in Utah I would not have. My father happened to be a civil engineer and was a district engineer for the State highway department for more than 40 years. The district that he supervised happened to start at Thistle and the borderline was Highways 50 and 89. That is where it stopped. He built the original concrete roads from Thistle to Kanab back in the 1920's, when they were originally gravel and dirt. And my mother's parents, she grew up in a town just 25 miles south of Thistle. So I literally made hundreds and hundreds of trips throughout my life down that canyon.

There are many other areas of the State where a slide of this magnitude would have been of very great interest to geologists but of no concern to anyone else. It is actually amazing, of all places, it could slide just where it did—at the intersection of two major U.S. highways and two tracks of rail that carries such a large percentage of our coal exports.

But having had all these reports, until I saw it myself last Saturday by helicopter, and walking up on the slide itself, it is impossible to really understand the magnitude of it. I was rather shocked at that massive amount of moving earth—trees, rocks, whatever—and the impact it had. Where you have seen a town that used to be much bigger, it has changed to a very small town with a few homes left. But, nevertheless, having viewed that, that reservoir created is larger than the reservoir for all of the Salt Lake City water system. On Saturday, there was only one building still sticking out of the water and that happened to be an old schoolhouse, which was up on the side of the hill by a bridge that crossed the river.

In any event, I realize the difficulty of the situation as far as FEMA is concerned, that you are in the business of disaster and that most of what has been done so far is preventive. I made that point to a lot of TV people there on Saturday. But what my immediate concern is, as I am sure yours is, is preventing the breach of the dam. It is still very fluid, still moving, a lot of massive materials still up the side of that mountain slipping down underneath and pushing upward. In fact, on Saturday, the dam was 185 feet above the former road level and the bed of the railroad. I assume it is still probably getting somewhat bigger and the lake continuing to fill. As a matter of fact, the estimates are by July of the runoff, if the lake is not drained, it could contain more than 50,000 acre-feet. And in the second most arid State in the country, which is not the second most arid State in the country this year, a 50,000-acre-foot reservoir is a lot of water. Our Deer Creek Reservoir, our major storage reservoir for all of Salt Lake City, isn't anywhere near that big.

POTENTIAL DAM BREACH

So my immediate concern is the situation of the breach of the dam. I have asked the Corps of Engineers, and they are out there seeing what they are able to do as far as draining it, whether they have the authority to do so or not, and if not, what FEMA is able to do. As of Saturday, everybody I talked to agreed it should not become a permanent lake, it did need to be drained, and the dam is not sufficient. Although there appears to be no immediate concern about breaching the dam, certainly no one felt it was stable enough to be considered a long-term, permanent dam.

So I do appreciate your cooperation to this point and expect to continue to work with you on a daily basis, and the rest of the Utah delegation, to see what we can do. It may not seem like a big disaster to some in terms of numbers, but where we virtually sealed off our coal-mining areas, the drop in business, the economic side impacts of this are rather dramatic. The detour by railroad is over 1,000 miles. The road detour to get from this area of Utah to the Salt Lake City area is around 130 miles. The service station business is off 50 percent, the restaurants, motels, everything with it. To an area that has the highest unemployment in our State, Carbon and Emery Counties, the layoffs will come rather rapidly. Steel, as well, depends on coking coal for their steel operations.

So I understand the difficulties of all of this. But in a small State like Utah, with the economic base that they have, this could be a major economic disaster because of the side effects, not the dam and the water that is backing up.

So we will continue to work with you closely on that, and supply any information we can to be of help. I understand the Governor's request for emergency declaration is now in your hands as of today.

Mr. GIUFFRIDA. That is correct. May I assure you that we are, and will continue, to stay in touch with the corps and with everybody else involved out there to do everything that can be done within the latitude that the law gives us.

Senator GARN. Well, I have never been quite so much in the spotlight in all my 16 years in public office in Utah, and I thought people were unaware of our positions back here. But believe me, everybody knew I was chairman of FEMA's appropriations subcommittee.

Mr. GIUFFRIDA. I tell you I had evidence of that. I was on the Larry King Show which goes out to about 10 million people, and I started getting calls from Utah about the rise in the lake levels. I said, "I know you are, but you've got Jake Garn."

Senator GARN. I knew you knew. I didn't know so many people at home did. As I was sitting there at the Big D Cafe, with all these TV people around, the first question is, "You are chairman of FEMA's subcommittee. What are you going to do about this?" I said, "Well, we certainly can't hope for a bigger disaster just so we can qualify."

But anyway, please proceed.

FEMA REQUESTS

Mr. GIUFFRIDA. All right, sir, thank you. In the interest of the demands on your schedule, I have an abbreviated statement, and I brought with me key members of my staff. With your concurrence, they will pick up immediately on those questions which are in their areas of expertise.

BUDGET REQUEST

Mr. Chairman, members of the subcommittee, our total request is for $559,928,000 in appropriations, $768,158,000 in outlays, and 2,716 in full-time equivalents. Compared to 1983, appropriations decrease by $30,774,000, outlays increase by $102,201,000, and full-time equivalents are increased by 296. The specifics of these changes are detailed in the budget justification. I will briefly address some of the most significant issues presented in our budget request.

INTEGRATED EMERGENCY MANAGEMENT SYSTEM

In 1984, we will be fully into our integrated emergency management system. This strategy has been presented to, discussed at length with, and is well received by the Defense Department, other leaders in the administration, and with State, local, private sector, and volunteer agency representatives.

The IEMS approach is based upon the premise that there are common functions required before and after all emergency situations to protect the health and safety of citizens. Clearly, this strategy is consistent with the Civil Defense Act, particularly its most recent changes, with other authorizing legislation, and with the Agency's overall mission, as established by reorganization plan and executive orders. The common functions include: mitigation, planning, preparedness, warning, communication, direction and control, shelter, movement of people, and provision of food, health, and medical resources.

Placing our priorities on these commonalities and establishing capabilities to deal with these requirements will provide a basic infrastructure and a foundation on which to build special capabilities to deal with the unique requirements of individual types of emergencies. Taken into account, of course, will be the variation in the scope, duration, speed of onset, and potential damage which characterizes the range of emergencies we face as a nation.

The year 1983 is a transition year. We are developing detailed guidance to put our new and more effective approach into full operation in 1984. The integrated approach is designed, first, to meet the President's civil defense objectives as set forth in the 1982 national security planning directive and the congressional objectives set forth in the 1980 and 1981 amendments to the Federal Civil Defense Act.

To foster a full Federal, State, and local government partnership with provisions for flexibility at the several levels of government for achieving common emergency goals. To emphasize implementation of emergency management measures which are known to be effective. To achieve full integration of emergency management planning into mainstream State and local policymaking and operational systems. To build on the foundation of existing emergency management plans, systems, and capabilities to broaden their applicability to the full spectrum of emergencies.

CIVIL DEFENSE

Our request for the civil defense program in 1984 is $253,517,000 and 745 full-time equivalents, an increase of $105,668,000 and 84 full-time equivalents over the current year.

We need the full $253.5 million requested for the civil defense program to begin orderly deployment of the integrated emergency management system that is mandated by our mission. The civil defense resources which exist at State and local levels of government constitute a major portion of the foundation upon which IEMS will proceed to build a truly comprehensive emergency management capability. The funding levels of the past decade have sustained an organization, but have provided only marginal capabilities to protect life and property in civil defense emergencies of all types.

FLOOD PLAIN MANAGEMENT

The request for the flood plain management program, authorized in the National Flood Insurance Act, is $65,780,000 and 214 FTE's, an increase of $5,179,000 over the current year.

This increase will enable us to put increased emphasis on completing the required flood studies by the proposed 1987 deadline, initiate five special studies on technical problems connected with specific natural hazards, and to provide technical assistance to local officials in applying the results of the flood studies in the management of their flood-prone areas. It will also enable us to initiate restudies, evaluate official appeals of flood hazard boundary and flood insurance rate maps, and increase monitoring of local flood plain management enforcement activities.

FIRE PREVENTION AND CONTROL

The fire prevention and control budget request provides funding for the U.S. Fire Administration and its fire prevention and control programs at basically the same level as 1983, $4,185,000 and 20 full-time equivalents. This funding will maintain a Federal fire focus to support the efforts of the Nation's fire and related services. Emphasis will be placed on the continuation and improvement of such programs as national fire data and analysis, fire prevention and arson control, firefighter health and safety, as well as fire services and rescue management.

TRAINING AND EDUCATION

In the training and education area, we are requesting $12,250,000 and 80 full-time equivalents, an increase of $1,317,000 over the current year. The program prepares Federal, State, and local officials to meet the responsibilities and challenges of a full spectrum of domestic emergencies through training in such areas as hazard mitigation, emergency preparedness, fire prevention and control, and disaster response through courses offered at the National Emergency Training Center in Emmitsburg, Md., and throughout the country in State and local training activities. The requested increase is to provide for essential fire and life safety improvements at the training center site.

COMPREHENSIVE EMERGENCY PREPAREDNESS

The 1984 request for comprehensive emergency preparedness planning is $6,974,000 and 48 full-time equivalents, an increase of $632,000 over the cvrrent year.

The requested increase will be allocated to the earthquake program to strengthen our lead role in earthquake preparedness, continue cooperative planning projects with the private sector, encourage adoption of improved seismic safety provisions, and develop with the Building Seismic Safety Council a policy and technical approach for abatement of hazardous buildings in the public and private sectors.

RADIOLOGICAL EMERGENCY PREPAREDNESS

The request for radiological emergency preparedness is $6,025,000 and 67 FTE's. For 1984, we are requesting downward adjustments to certain elements within the program to offset an increase of $547,000 for the commercial nuclear powerplants facilities element. This adjustment will allow us to test and evaluate the Federal response plan for commercial nuclear power facility accidents, continue to upgrade uniformity of radiological emergency plans and excercises, and to test alert and notification systems for approximately 33 sites.

FEDERAL PREPAREDNESS

For Federal preparedness, we are requesting $131,878,000 and 898 FTE's, a net decrease of $13,247,000 in budget authority and an increase of 212 FTE's. The purpose of this program is to insure that the Nation will be able to respond to, manage, and recover from national security emergencies and to enable government, at all levels, to cope with the consequences of accidental, natural, and manmade occurrences. These goals are being achieved by directing and guiding emergency planning activities and conducting programs assigned to FEMA in such areas as Government preparedness, resources preparedness, mobilization preparedness, and Federal preparedness policy and planning.

DISASTER RELIEF

There is for 1984 no new budget authority being requested for disaster relief because the unobligated balances in the account appear sufficient for the upcoming fiscal year.

NATIONAL INSURANCE DEVELOPMENT FUND

The national insurance development fund supports two programs: riot reinsurance and Federal crime insurance. For 1984, $17,077,000 is anticipated in borrowing authority.

The administration is recommending that each of these programs be terminated at the end of fiscal year 1983. There are numerous reasons for the termination of these two programs. The riot reinsurance program has only 11 contracts reinsuring 16 companies. We have no doubts that these few companies could find reinsurance protection in the private sector.

The crime insurance program never reached the potential anticipated when it was begun. With less than 58,000 policies in force today, the program is losing about 1,000 policies per month. This is an indication that policyholders are able, for the most part, to find coverage in the private market. In New York, for example, where 60 percent of the policyholders reside, we are working with the State to provide alternatives to Federal crime insurance.

NATIONAL FLOOD INSURANCE FUND

For 1984, FEMA is requesting an appropriation of $37,521,000 for the national flood insurance fund to be used to repay borrowing against the $1 billion borrowing authority. This represents a decrease of $1,638,000 from the amount appropriated in 1983. Our objectives are to make this program self-supporting by 1988, to operate the program on a more businesslike basis while encouraging prudent decisions regarding areas affected by the flood hazard, and to increase insurance industry involvement in the program.

SALARIES AND EXPENSES

The 1984 request for salaries and expenses is $127,591,000 and 2,709 FTE's, an increase of $14,646,000 and 296 full-time equivalents over the current year. This appropriation provides the salary and other costs required to provide executive direction, administration, and staff support to FEMA's programs in the headquarters office and field offices.

The $14,646,000 increase will provide full-year funding of the October 1982 general pay raise, the December 1982 executive pay raise, medicare hospital insurance costs effective January 1, 1983, and funding for 296 new full-time equivalents requested for activities in civil defense and Federal preparedness.

In summary, Mr. Chairman, the request before the committee will support the President's commitment to improve the country's emergency preparedness and national security posture. It continues and, in some cases, enhances Federal programs which contribute to emergency preparedness and life safety throughout the Nation. And it proposes the elimination of programs which we believe can best be handled in other ways.

Thank you, Mr. Chairman. My staff and I will be pleased to answer any questions you may have at this time.

IMPROVED BUDGET JUSTIFICATIONS

Senator GARN. Thank you very much.

Last year, I requested that you include additional material in your future budget justification, the staffing levels for each program as an example. This year's justification, which incorporates these suggestions, is much improved over your prior justifications. So, I would appreciate it if you would continue to work with the staff in that respect.

PROPOSED REPROGRAMING

On January 28, you sent a letter to the subcommittee transmitting FEMA's 1983 operating plan and requested several reprogramings. One of the reprograming requests involved reducing your R&D activities by $825,000 in fiscal year 1983. In fiscal year 1984, you are requesting an increase of $9,325,000, or 254 percent, for R&D.

Over the last few years, it seems that you have asked for large increases in R&D and then when your budget was reduced, R&D was the first item cut.

Do you intend to follow that same pattern this year if the Congress reduces your overall request?

Mr. MAGUIRE. Mr. Chairman, in the recent past we have had to reduce the R&D allocation when our overall budget was reduced as an expedient measure to help preserve an underfunded Agency program. We have attempted to maintain a system capable of absorbing and applying not only research results, but also an expansion in our overall capacity. As a result of these R&D reductions, we have cut the normal lead time between research and its application to the point where we now have to make some decisions without appropriate research results. We have not tested designs that we should have been able to. Our R&D must be supported in fiscal year 1984 if we are to be able to carry out an enhanced program based on validated research.

Mr. Chairman, we don't intend to follow the same pattern this year. However, we will evaluate program priorities and carry out the research that is needed to enhance our overall efforts.

Mr. GIUFFRIDA. Mr. Chairman, I would like to specifically address that and indicate that was a hard call for me to make, but I made that call because we needed it at the National Emergency Training Center. We had no heating and air-conditioning systems in some of the classrooms and most of the dormitories, and it didn't make a great deal of sense to us in building a quality program and bringing up key decisionmakers to our center. Two weeks ago, for example, we had all the superstructure of Atlanta, Fulton County, Ga., taking our emergency management training. I said if we are going to do this right, we need to have the facilities upgraded. I made that call. It was a hard one.

INTEGRATED EMERGENCY MANAGEMENT SYSTEM

Senator GARN. This year you are emphasizing the need for an integrated emergency management system. This approach is entirely consistent with the position taken by this committee in fiscal year 1983. I would like to remind you, however, that last year when our staff asked for a listing of the CD program activities that had a dual use, both peacetime and wartime, you stated, "It must be recognized that the entire CD program is essential for attack preparedness." I might add that it took several weeks to convince FEMA that such a list could be prepared, and even when it was delivered, it was done reluctantly. Your staff noted that determining what had dual use was a judgment call.

How do you account for your current ability to make those distinctions?

Mr. MAGUIRE. As Director Giuffrida stated in his opening remarks, our integrated emergency management system is designed to build on the foundation of existing emergency management plans, systems, and capabilities so that we can broaden their applicability to the full spectrum of emergencies. We are taking a look at each and every program element in the civil defense program and ascertaining how it could be applicable to the full range of threats which FEMA is chartered to deal with. We are putting the common elements in a priority position in our overall program so that we develop first the infrastructure that is required so that we have a predictable, fully responsive emergency management system for the Nation. In this manner, we think we are taking full cognizance of the 1980 title V implications of the Civil Defense Act and designing a system that not only responds to the nuclear attack preparedness concerns, but also responds to the natural and technological hazards that we are faced with. And, therefore, in our program elements this year you will find that we stress both elements of our responsibilities.

SYSTEMS REQUIREMENTS

Senator GARN. Could you supply for us an updated dual use table that you gave us last April?

Mr. GIUFFRIDA. Yes, sir.

[The information follows:]

MULTIPLE USE CAPABILITIES OF IEMS

Last year FEMA provided to the subcommittee a table which reflected estimates of dual-use (more accurately, multiple-use) capabilities inherent in the various activities comprising the civil defense program. This year, the adoption of the Integrated Emergency Management System (IEMS) approach makes it feasible and desirable to address only the few elements which are not clearly multiple-hazard in nature. Most elements of the program have always been multiple-use in nature, and FEMA is acting to maximize the multiple-hazards application of the remaining elements, under the IEMS approach.

The use of civil defense emergency facilities and systems in peacetime disasters is routine. The National Warning System (NAWAS) is used to warn localities of severe weather threats, and local civil defense siren systems are used to warn the people about approaching tornadoes. Key officials direct lifesaving operations from local Emergency Operating Centers during many types of emergencies, and emergency advice and instructions are transmitted to the public by local officials, using stations of the Emergency Broadcasting System. Radiological instruments and trained personnel provide support in road accidents or other emergencies involving radioactive materials. Without these basic capabilities, which are supported by civil defense funding, communities would find it much more difficult to deal with local emergencies.

The integrated approach is based upon the fact that these and other emergency systems and capabilities are inherently multihazard in nature. In addition, FEMA is acting during FY 1983 to maximize the multiple-hazards payoff of all preparedness elements. Substantive changes will include, among others, the following:

- The current shelter survey will be broadened to an all-hazard survey, to identify protection against tornadoes, hurricanes, and other threats as well as nuclear attack effects.

- Relocation plans will be modified to take into account all types of hazards requiring evacuation such as a hurricane, toxic spill, flood, nuclear reactor accident, or a terrorist threat. Integrated plans will also provide for the care and sheltering of people in reception areas who have been forced to evacuate by any of a variety of hazards. (This could include, for example, care of people from an area severely damaged by an earthquake, until repair of damaged buildings and power lines made it safe for them to return.)

- Radiological defense officers will expand their ability to plan for and respond to all radiological hazards, such as major transportation accidents or other incidents that have potential for release of radioactive materials; accidents at nuclear power plants; and detonation of a nuclear weapon by accident -- as well as a nuclear attack on the United States.

- The use of shelter stocks and equipment will be examined for possible added benefits in local emergencies.

- Industrial Capability Protection Planning will be multiple-hazard in nature, in keeping with current practice in American industry.

- All training and education activities will be multiple-hazard in nature.

Listed below are the only elements of the FY 1984 civil defense program which are not clearly multiple-hazard in nature, although there are multiple-hazard potentials in these areas as well.

State and Local Assistance Appropriation

Population Protection

Shelter Preparation -- This sub-element ($2.4 million) provides for developmental work on shelter stocks and life-support systems, as a basis for procurement in future years. As noted previously, there may prove to be multiple-use applications for such capabilities; however, we have conservatively estimated, for the time being, that shelter stocks are not multiple-hazard in nature.

Protection of Industrial Capability -- The Industrial Capability Protection Planning portion of this sub-element ($1.1 million), as noted previously, will be multiple-hazard in nature. For the time being, we estimate that the balance, for Keyworker Blast Protection ($7.1 million), is not multiple-hazard in nature, although such applications could become apparent, as in protecting workers against tornadoes or possibly earthquakes, as well as chemical and other emergencies or explosions.

Emergency Planning and Assistance Appropriation

Research -- We estimate that of the $20.00 million requested for research, some $7.2 million is for projects primarily oriented to nuclear attack effects, while the balance of the research will have multiple-hazard applications.

Telecommunications and Warning

Other State and Local Direction, Control, and Warning -- This sub-element ($1.250 million) provides funding for electromagnetic pulse (EMP) protection of Federal, State and local direction and control communications; protection is provided for Emergency Broadcast System stations, Emergency Operating Centers, and communications networks. We have conservatively estimated, for the time being, that EMP protection is not multiple-hazard in nature, although on at least two occasions which have been reported to us, EMP protection has protected communications facilities against lightning, when facilities without this protection have been put out of operation.

The foregoing items total some $17.9 million, out of a total of $220.14 million requested in FY 1984 for the State and Local Assistance and the Emergency Planning and Assistance appropriations, or about 8.1 percent of the total. Applying this percentage to the Salaries and Expenses (S&E) appropriation request of $33.38 million for civil defense indicates that about $2.7 million of the S&E request could be estimated as being for primarily attack-oriented effort, with the balance of some $30.7 million being for FEMA effort that is multiple-hazard in nature.

Thus, of the $253.5 million FY 1984 request for civil defense, some 91.9 percent (or $232.9 million) is multiple-hazard in nature, while about 8.1 percent ($20.6 million) is primarily for attack hazards.

We would emphasize that the foregoing estimates are based on judgment, and that judgments can vary considerably. However, we have attempted to be conservative in judging multiple-hazard applications, as indicated above.

INTEGRATED SYSTEM PROPOSED

Mr. GIUFFRIDA. I would like to add one comment, Mr. Chairman.

Senator GARN. Sure.

Mr. GIUFFRIDA. Historically in this country, we have addressed emergencies by type. Even the enabling legislation has the distinction of the Fire Prevention Control Act, the Earthquake Reduction Act, et cetera. What has been missing is an appropriate cognizance of the fact that whether you are responding to an earthquake, flood, a mudslide, or a war, you need the same elements in place in advance of the requirement. You need an integrated Federal, State, and local system that has as elements management, evacuation, moving people from areas of high risk to lesser risk, shelters, communications, continuity of government, law and order, resource management, food and health delivery, and so on. The infrastructure has not been there.

When we appeared in front of your committee last year, I mentioned that that is where we are taking our programs to fill this blank. You can't have a system in place that needs to move people from point A to point B on demand if you haven't built before some of the communications, some of the warning systems. And I would remind the committee most of our money is passed through to the States to build these. Some of the communications systems we have in place, like in Kentucky and Alabama, were put there in the 1950's. The people that have to implement these systems at the local levels need to be trained. They are not now trained at a satisfactory level. And for that there is no magic, no razzle-dazzle. That is exactly what this integrated system is for, to systematize the approach so the result can be predictable and effective.

RESEARCH

Senator GARN. In last year's justification, there is an interesting statement under research accomplishments. Regarding multihazard research, you stated:

Commonalities between nuclear disaster and other types of disaster were identified and evaluated, and showed that the field is so broad technologically that while degrees of overlap are identifiable, program and political aspects could limit transferability.

How do you reconcile the statement in last year's research justification with your current integrated emergency management system proposal?

Mr. MAGUIRE. We are performing those areas of research, Mr. Chairman, which stress the common elements, putting priority on those systems which have multihazard application and performing them first in our program, putting off those elements that do not stress the common need for both the nuclear attack and the technological hazards.

NONATTACK PROGRAMS

Senator GARN. How much of the civil defense effort in 1984 will be devoted to the non-attack part of the integrated management system?

Mr. GIUFFRIDA. The overwhelming majority of it.

Senator GARN. The majority?

Mr. GIUFFRIDA. Yes, that is what we are dealing with, with a continuum of natural and technological disasters and emergencies. That is what the system is built on.

Senator GARN. Can you put some type of percentage estimate on the majority, like the weathermen do?

Mr. MAGUIRE. Mr. Chairman, it is less than 10 percent for attack-oriented activities, a minimal part of the overall budget request for this year.

Mr. GIUFFRIDA. Ninety-two percent is the number we agree on. I hate to give you a number because then I will have to eat that number later on.

Senator GARN. Well, weathermen get away with it.

Mr. GIUFFRIDA. Yes, sir.

Senator GARN. You have a 70-percent chance of rain and 30 percent came through.

Mr. GIUFFRIDA. We will take 92 percent and hang with that, Senator.

Senator GARN. Have you noticed that with the weathermen, there is no way they can say they were wrong. They say there is a 70 percent chance of rain. It didn't rain. Thirty percent chance of sunshine, they were right.

Can you provide a breakdown between nuclear attack and nonattack activities for the record?

Mr. GIUFFRIDA. To the best of our ability to do that, yes, sir.

Senator GARN. If you had not adopted the integrated emergency management system, what specific activities would have been deleted or reduced from your budget request and what activities would have been added or augmented? And if you could, provide a detailed listing for the record.

Mr. GIUFFRIDA. Again, we will do the best we can.

[The information follows:]

IMPLEMENTATION OF IEMS

FEMA developed its integrated emergency management system (IEMS) approach in the summer and autumn of 1982, including extensive discussions within FEMA and with the Department of Defense, the National Security Council staff, and State and local leaders. The fiscal year 1984 budget request was prepared in December 1982 and January 1983, and was based on the IEMS concept and approach. The basic significance of the IEMS approach lies in the substantive changes outlined in the previous insert relating to a number of program elements and subelements, rather than in the amount requested for any given subelement.

To repeat two of the examples, the current shelter survey is being broadened in fiscal year 1983 to identify buildings providing protection against tornadoes and other domestic hazards, as well as attack effects; emergency planning activities are being broadened to address all hazards peculiar to a given locality. Thus, emergency plans for in-place protection, for short-warning threats, will address such hazards or tornadoes and earthquakes, as well as attack with only short warning (considered very unlikely). Emergency plans for evacuation will address hazards arising slowly enough to permit protecting people by helping them move to safer areas; such hazards, for a given community, may include one or more of hurricanes, floods, release or threatened release of a toxic substance, nuclear powerplant accidents, and terrorist incidents, as well as an acute international crisis.

These and similar aspects of the IEMS approach can be implemented at various overall budget levels and, in fact, will be implemented at the final fiscal year 1984 appropriation level resulting from congressional action.

RISK AREA RELOCATION PLANS

Senator GARN. None of the 30 most heavily populated U.S. risk areas, which contain 84 million people living in or near most of the Nation's major cities, have completed their initial crisis relocation plans. If the objective of U.S. civil defense is to protect the population from nuclear attack and make the United States less vulnerable to crisis coercion, why has FEMA given priority to the completion of these plans in counterforce areas where their life-saving potential is less?

Mr. MCLOUGHLIN. Senator, it is true we put our emphasis on counterforce areas in the early 1980's for the development of crisis relocation plans (CRP). It is a time-consuming and complex activity. So we did start with the smaller, more rural areas in order to understand the process and make sure we had a good model. It is an incorrect statement to suggest we have not dealt with the 30 largest communities or cities in the country. We have completed Dallas-Fort Worth, which has a population of about 3 million; we have completed San Diego, which has a population of 1.9 million; and we have completed Riverside and San Bernadino, which are about 1.6 million. And we propose to work in the city of Detroit in the 1983 time frame.

RELOCATION PLANNING IN FISCAL YEAR 1984

Senator GARN. How many cities are you planning to fund the development of crisis relocation plans during fiscal year 1984?

Mr. MCLOUGHLIN. About 400, with our integrated emergency management system approach. We do expect a drop of about 90 percent in the number in 1984, principally because we will be in a training mode in terms of the additional planning guidance that we have to provide to the State planners for the all-hazard evacuation planning activity.

Senator GARN. I have several more questions on crisis relocation, but I would like to turn to Senator Huddleston at this time and I will come back to it.

EARTHQUAKE HAZARDS REDUCTION

Senator HUDDLESTON. Thank you, Mr. Chairman.

First, in the area of earthquake hazards reduction, FEMA has conducted earthquake vulnerability studies in six cities in the New Madrid region. What were the results of those studies?

Mr. MCLOUGHLIN. Senator, the results of those studies have not yet been published. It will still be a couple months before those are finalized. Clearly, our intent there is to complete vulnerability analyses and assessments that will have application throughout the New Madrid fault area.

Senator HUDDLESTON. You are aware of other studies that indicate a high degree of vulnerability for a wide area there.

Mr. MCLOUGHLIN. Yes. But, Senator, the purpose of the study is not just to determine the area's vulnerability—USGS has told us it is vulnerable—but to study the specific vulnerability of lifelines, like utilities, rail systems, and those sorts of things.

Senator HUDDLESTON. Talking about the common elements in any kind of a protection system, nuclear or earthquake and other kinds of civil disasters, they are considerably different, aren't they?

Mr. MCLOUGHLIN. They are. There is a difference in disasters.

Senator HUDDLESTON. How to deal with the effects of earthquake, I would imagine, would be somewhat different from nearly any of the others. Of course, if you have injured people, it would be the same.

Mr. MCLOUGHLIN. Senator, the things we need to look at are the commonalities of the functions—the communications systems, the supporting operations would be the same, warning systems, the need for sheltering of people, the selected evacuation activity, health and medication, direction and control facilities.

Senator HUDDLESTON. Do you work with local agencies; the State of Kentucky has a task force, for instance, on earthquakes?

Mr. MCLOUGHLIN. Yes. We have been in contact with your State people on earthquakes. We are in the process right now of working through our region IV office in Atlanta to transfer some money to the State of Kentucky to set up a seismic safety panel, which is the first step in our preparedness activity with the State of Kentucky and the others in the seven-State area of the New Madrid fault.

Mr. GIUFFRIDA. Senator, people from Kentucky and people from FEMA meet frequently on this issue.

Senator HUDDLESTON. I understand they are.

I am sure we recognize that the most severe earthquake ever registered in the United States occurred in the New Madrid area in 1811. We have a fine lake as a result of it. The other damage I guess has passed away by now.

What activities in the central U.S. earthquake preparedness project will be sponsored by FEMA in fiscal 1984?

Mr. McLoughlin. We do expect to undertake preparedness activity in several selected States. We are working with seven States right now on setting up seismic safety panels. One, of course, is Kentucky, as I mentioned earlier. That is basically the first step in a preparedness activity. It is to give direction of this activity in each State a specific focus, because that is the panel of local and State officials who are key decisionmakers. That is our first step.

We also have the vulnerability assessment that we are working on now, and then we attempt to provide more preparedness planning money.

FLOOD INSURANCE RATES

Senator Huddleston. The other questions I have regarding that subject I will submit, Mr. Chairman.

I want to turn to the flood insurance program.

The Federal Insurance Administration has increased the flood insurance rates three times since 1981. According to GAO, this has already raised average risk premium rates by about 150 percent. When do you expect another rate increase, and what size is it likely to be?

Mr. Bragg. Senator, we haven't determined precisely when we would have another rate increase or the size of it. We review the rates twice a year to determine what the needs are. We are in the process of doing a review now. We would expect sometime in the next fiscal year there would be another increase. It would be no greater than 20 percent, but we cannot be more precise than that at this time.

SELF-SUPPORTING FLOOD INSURANCE PROGRAM

Senator Huddleston. I understand the goal is to make the flood insurance program self-sustaining by 1988. Do you have any estimates as to how much premiums would have to be increased in order to make the program self-sustaining?

Mr. Bragg. Well, early in the administration there was an analysis done, and the conclusion of that analysis was that it would require rate increases of approximately 10 percent per year to reach that goal. However, we could become self-supporting with less rate increases if, for example, we were able to expand the policyholder base and perhaps increase the deductibles.

DECLINE IN POLICYHOLDER BASE

Senator Huddleston. Well, that has been something of a problem, the number of policyholders. Has that declined?

Mr. Bragg. They have declined slightly over the last 2 years. We believe that is primarily the result of reduced flooding activity and the reduction in mortgage activity. In other words, less people are buying or building new homes which reduces the demand for flood insurance. If we are able to expand the policyholder base, we believe that we would not have to have increases as large as we have had to have in the past.

Over the last 4 months we have had increases in our policyholder base, so we are beginning to see participation increase.

Senator HUDDLESTON. Do we need to do a better selling job?

Mr. BRAGG. My personal view is that we need to deliver the services a little differently. We have been working with the private insurance industry to reinvolve them in the flood insurance program. We believe that if we are successful in those efforts, we would be able to reach a vastly greater level of participation than we have ever had in the past.

ADMINISTRATIVE EXPENSES

Senator HUDDLESTON. What if administrative costs had not been provided by appropriated funds, what would the rate have to be?

Mr. BRAGG. The rates that we are recommending would include all administrative costs and operating costs for the program. We have included those costs as well as the cost of claims. That is what we mean by self-supporting—all costs related to the program are offset by premium and investment income.

Senator HUDDLESTON. But the 20-percent rate increase wouldn't cover that?

Mr. BRAGG. We are not to the point where it would cover all our costs and probably won't be until later in the decade.

Senator HUDDLESTON. 1988.

I will have other questions to submit on that, Mr. Chairman.

CIVIL SECURITY PROGRAM

Just briefly on the civil security program, in this year's budget submission you describe certain objectives of the civil security program with the following language:

> To assure that the Nation has plans, systems, procedures, and resources to reduce the potential consequences of major incidents of terrorism, civil disorders, and sabotaqe.

Do, or will, any of these plans or systems or procedures involve any of FEMA's people in actually collecting information or intelligence in these areas?

Mr. GIUFFRIDA. No, sir.

Senator HUDDLESTON. Has FEMA or any of its people ever been involved in collection activities?

Mr. GIUFFRIDA. Not that I am aware of. And I have specifically prohibited any such activity. FEMA is not an intelligence collection agency. FEMA is a legitimate consumer of intelligence information, and the mechanism is in place for us to ask any of the intelligence agencies if we need that information.

Senator HUDDLESTON. And have you done that?

Mr. GIUFFRIDA. No, sir. We get the routine briefings everyone else gets. I did ask for the briefing on Soviet civil defense capability.

Senator HUDDLESTON. Mr. Chairman, I believe that I can submit the remainder of these questions, if that is satisfactory.

Senator GARN. Certainly, we will be happy to submit them for your response in writing.

CRISIS RELOCATION PLANS

Let me get back to the crisis relocation.

Why don't you try to develop prototype plans in two or three cities first and then use these plans as guidance for other cities?

Mr. McLoughlin. That was an alternative that was considered, Senator, after we had the initial experience. But the question then is, do we complete the planning in one area and do basically what we call enhanced crisis relocation planning, or do we do the initial planning for as much of the country as we can in order to move people out of the risk areas? The judgment call that was made in the Agency was that the best strategy is to do the initial planning to cover most of the population.

Senator Garn. How can FEMA effectively estimate crisis relocation planning costs or demonstrate overall plan effectiveness and feasibility unless some areas are completed as prototypes?

Mr. McLoughlin. The fact that we do not complete the entire crisis relocation planning activity doesn't mean that we don't have some good handles on the cost factors. Senator, the two phases would go something like this:

The crisis relocation plans we are talking about are the plans to move people out of the risk areas, to indicate where they should go and how they should be sustained in the host areas. The follow-on, or enhanced activity, is the planning that must be done to deal with the emergency response itself—the medical, the health, the welfare, and the public works activities. A lot of that kind of planning is going on right now and has gone on for years with many communities planning for the full range of potential disasters, as we talk about in our integrated emergency management system approach. We clearly can get a handle on cost estimates based on that work that has been in existence for some time.

Senator Garn. Have you developed new computer simulation models, or used existing traffic flow models, to plan or test evacuation plans?

Mr. McLoughlin. The plans in effect are State and/or local plans, and we have had transportation experts involved on a contract basis helping us in providing the planning guidance. Specifically with regard to simulation models at the moment, the answer to that is "No," as far as I know.

CRP REJECTION

Senator Garn. The effectiveness of the crisis relocation plan concept is dependent upon the degree to which State and local governments participate. How many local qovernments have rejected this concept and what has FEMA done to determine how many will participate?

Mr. Jett. Last year, Senator, several communities and States did indicate that they would prefer not to do crisis relocation. This year, we are talking carefully with States through our regional offices, principally to acquaint them with the new strategy that we have to work with the communities on a generic-type evacuation plan that would be applicable to the threats that face their communities, including the possibility of a nuclear threat. What we are finding is that communities that expressed some interest or were undertaking activities last year against crisis relocation planning are deferring taking action right now, adopting more of a wait-and-see attitude to see what this IEMS is about and how FEMA will be carrying it out.

We have had the State of Maryland pass legislation in their budget act indicating they would not be doing crisis relocation planning applicable to attack. Whether we will be able to work with the State of Maryland as to the generic-type evacuation they may be able to undertake. We are working with the State carefully. Other than that, I think we are being effective in communicating with the communities and States that we want to talk comprehensive emergency planning, and that seems to be having an effect on their attitudes.

CRP IMPLEMENTATION

Senator GARN. Local governments who have completed initial crisis relocation plans in at least four FEMA regions have apparently done little to develop the procedures and training needed to implement these plans in the event of a nuclear attack. What is FEMA doing to address this problem and why should Congress continue funding this program unless local governments are willing to develop the ability to use these plans?

Mr. McLOUGHLIN. Senator, I am not familiar specifically with the cases you address in the four regions. I would be happy to address individual ones for the record, if you like.

In general, it is true we do have a mandate to provide assistance to State and local government. Our current budget justification requests 60 additional people in this area that we would add to our staffs at the regional level to assist States in working with communities to improve the nature of the planning that is done there.

[The information follows:]

CRISIS RELOCATION PLANS

A draft of a recent proposed report prepared by the General Accounting Office (GAO) on civil defense programs expressed doubt about local governments ability to implement crisis relocation plans. GAO personnel reported that some local governments have expressed reluctance to refine and update initial crisis relocation plans and to develop the operational procedures and coordination needed to assure that actions identified in the plans can indeed be carried out. Individual problems raised in specific jurisdictions were not identified in the proposed report.

To date, FEMA has concentrated its efforts on the development of initial crisis relocation plans and about 37 percent of the jurisdictions requiring such plans currently have them. As plans continue to be developed, FEMA will focus on development of a capability for performance.

Tests and exercises are essential to develop a capability to execute plans for any type of emergency whether natural disaster, technological hazard, or nuclear attack. FEMA has urged exercising of all emergency plans and under an accelerated civil defense program, would assist localities in conducting annual exercises for key officials for evacuation and reception and care plans. Test and exercise guidance is currently under development and standards and criteria for evaluation of plans and a preparedness capability are being developed for dissemination to State and local jurisdictions. When these test and exercise guidance materials are finalized, along with the standards and criteria, intensive training programs will be initiated and we expect that there will be a rapid improvement in this area.

CRP COORDINATION

Senator GARN. According to GAO, they say the crisis relocation planning and coordination between Federal, State, and local government appears inadequate. What is FEMA doing to encourage greater participation and coordination by other Federal agencies with critical emergency roles in the development of these plans?

Mr. McLOUGHLIN. Senator, one of the things we are doing is working through the EMPB, the Emergency Mobilization Preparedness Planning Board. We have a specific committee dealing with civil defense. There is a civil defense working group, of which I am the acting chairman. And, in fact, we just had a meeting yesterday and we are indeed working on the problems of Federal agency coordination and commitment to the entire range of emergency activities that include civil defense.

Senator GARN. Is GAO accurate in their description it is inadequate?

Mr. GIUFFRIDA. I requested a GAO audit and an OMB audit the first 2 weeks that I was in this seat, and the reason I requested it is because things were in such a sorry state. Some of them have improved.

I have a problem, however, which I would like to express. GAO reports sometimes are written in the present tense and are describing facts and surveys that were made in the past and don't take cognizance of remedial actions that may have been implemented. Some of these we have started to correct. Some we have corrected; some are still in the process of being addressed. But yes, the GAO report at the time it was made was accurate.

Senator GARN. Sometimes GAO doesn't know what they are talking about.

Mr. GIUFFRIDA. Well, I wrote Mr. Bowsher about my concerns on the major audit. They came in when I asked for them, but they didn't do the report until a year and a half later. FEMA submitted a lengthy response which was put in the back in the appendix and I wanted it in the front in the executive summary so when you and all the other decisionmakers read it you could see my comments. I must say they came around to assisting us in that process.

Senator GARN. Well, I have seen a lot of GAO reports on various subjects. Sometimes they are well done, very good and well taken. Sometimes I wonder where they got their facts and figures. My experience is I have to evaulate GAO reports on an individual basis.

Mr. GIUFFRIDA. We have got a good working relationship with them.

Senator GARN. I don't know who to get to do a report about GAO. I don't want to create an agency to check on GAO.

Mr. GIUFFRIDA. We don't want the job, Senator.

INDUSTRIAL PROTECTION

Senator GARN. Attack-related civil defense effectiveness is dependent upon the approval and implementation of industrial protection and essential worker protection program elements. The Soviets and other nations understand this and have developed a relatively sophisticated industrial worker protection system.

Do you consider worker protection for such industries as utilities, hospitals, food and fuel processing to be an integral part of a mature civil defense plan?

Mr. MAGUIRE. That is correct, Senator. We are fully aware of the Soviet civil defense program and their current plans. We believe that in addition to the population protection aspects of the plan, which we are in the implementation stages on now, it is essential to have protection not only for the key workers but for the industry equipment to support defense and vital civilian needs. We are in the process of performing research programs to determine the cost implications of additional modifications that need to be made for industries. We are also looking at those industries that need protection so we can have this hand-in-hand industry protection and population protection capability for the civil defense of the Nation.

Senator GARN. GAO tells us in a study that was initiated by the subcommittee that costs could double, from $4.2 billion to over $8 billion, as a result of this. Do you have any plans to request funding for an essential worker protection program?

Mr. MAGUIRE. Senator, since this is a year we are investigating the capital costs, we are investigating the optimal mix of industries that we should protect; we are not at a point yet where we know what the overall cost implications are. I have not seen any published data that tries to correlate the overall cost of this program within FEMA. We are fully aware of the need to provide a program at the national level that is an effective one, but also fully aware of the need that that program must be cost effective, and we expect by the end of this year to have our thoughts put together and to be able to better address that question.

DOSIMETER PRODUCTION

Senator GARN. How much do you have in your fiscal year 1984 budget for dosimeter research and prototype production?

Mr. MCLOUGHLIN. Senator, if you will let me check just a moment, I will tell you that.

We are asking, in the radiological instrument area, for $13.325 million. Now that includes more than just dosimeters, that includes maintenance and calibration shops we run at the State level where we have 157 people that we are funding in order to maintain and calibrate our instruments.

With respect specifically to dosimeters, we expect to use $5.6 million in our dosimeter pilot test production facility at Rolla, N. Dak., and in an ultimate purchase on the open market of a selected number of dosimeters. That number will depend on the amount of money that it takes us to deal with the production at the Rolla facility.

Senator GARN. How many dosimeters do you expect to produce in fiscal year 1984 and at what average cost?

Mr. MCLOUGHLIN. Our objective in terms of FEMA producing them, was that the question?

Senator GARN. Yes.

Mr. McLoughlin. In the budget we talk about producing 10,000 high-range dosimeters and 10,000 low-range dosimeters, but our objective is not specifically to produce 20,000 dosimeters. Rather, our objective is to produce a well-documented, closely monitored production process from which we can develop good engineering specifications that then will permit us to go on the open market to purchase a large number of dosimeters. If the process proves as successful as we expect, we ought to be able to produce them for something around $10 per unit. We would expect the open market cost would be around $10 per instrument.

Senator Garn. I am sure you are aware this is a very controversial issue of how many you produce, and I just want to make sure you have an understanding it is very controversial.

First of all, I told Senator Andrews in a letter that I don't want us to get backed into any position where the Federal Government is in the production business to the detriment of small, particularly small, private sector companies. I assume that it is not your intent to let that happen.

Mr. Giuffrida. That is absolutely correct, Senator.

Senator Garn. Second, I do not intend to support a request for funds to continue production of other than a limited number of prototypes beyond fiscal year 1985 unless it is done on a competitive basis. I assume this preproduction period would be sufficient to develop your production technology.

Mr. McLoughlin. That should be an adequate period of time. It is our expectation to do all of our large-scale procurement in the open market. We may very well be doing some additional prototype production beyond 1985 for some instruments we have now in the experimentation stage.

DISASTER RELIEF FUND

Senator Garn. According to your justification, the disaster relief fund carried an unobligated balance of $527,984,000 from 1982 to 1983. Combined with the 1983 disaster relief appropriation of $130 million, the total available at the beginning of 1983 was $657,984,000.

Do you still believe that the carryover funds available during 1983 and 1984 will be sufficient until the 1985 budget becomes effective in October 1984?

Mr. McLoughlin. Barring any large-scale disaster, the answer to that is "Yes." We had expected to obligate about $226 million in fiscal year 1983, and we are on schedule. So the $432 million still looks like a good figure. According to our calculations, from 1974 to 1982, there were only 2 years, 1978 and 1980, in which we used more than the projected carryover balance into 1984.

Senator Garn. Last year's committee report supported the continuation of the 75-percent Federal/25-percent State and local cost sharing for the repair or replacement of public facilities. Has the policy of a 75/25 percent split on public disaster aid made a difference in State requests for assistance?

Mr. McLoughlin. It is possible that it has, Senator. But, candidly, the State where the large disaster does occur does need Federal assistance, and 75-percent Federal assistance is a significant contribution to the effort and the assistance that is indeed needed.

Senator GARN. Do you have any estimate of how much this policy might have saved the Government to go cost sharing?

Mr. MCLOUGHLIN. From 1980, Mount St. Helens, when we initiated this, we have spent $225 million on public assistance, which requires the 75/25 match. That would suggest that the Government has saved up to $75 million with this policy. In addition, it is probably true that State and local governments have been more judicious in submitting their project applications since they do indeed have to be sure they are necessary projects.

GAO REPORT ON FLOOD INSURANCE RATES

Senator GARN. Last month, GAO completed a report on the effect of premium increases in the flood insurance program. This report, requested by Chairman Boland, is somewhat schizophrenic in nature. On the one hand, the report states:

> The same month the agency first raised rates—January 1981—individual participation in the program as measured by the number of policies in force began to decline.

A little later in the report, GAO concludes:

> While the rate increases did have some influence on the decline in program participation, other factors, in particular the smaller number of floods in recent years and the general recession, also negatively affected the program participation.

And further on in the report, GAO states:

> The statistical techniques used by GAO cannot determine with any degree of precision the relative effect on program participation of the rate increases as opposed to the other factors.

In a similar vein, the report notes that during the recent rate increases:

> Six small communities left the program.

Then on the next page, GAO states that, after contacting each of these communities:

> None of the communities left the program because of the rate increases.

Well, it is a little difficult to know what to make of the report, and I would like to know what your conclusions are.

Mr. GIUFFRIDA. We agree with yours.

Senator GARN. In the record we said "schizophrenic." Schizophrenic is your response to the report.

Mr. BRAGG. Mr. Chairman, we felt all along the reduction in the policyholder base in the flood insurance program was related to reduced flooding activity and reduced activity in the mortgage area. We think that the GAO report basically supports that because their findings stated that the demand for flood insurance was relatively insensitive to the rate increases. Working with the GAO and on our own, we have done some analysis which indicates, for example, that new policy application activity is substantially dependent on Federal mortgage activity. Sixty to seventy percent of the variance in the level of new applications can be explained by the level of federally related mortgage activity. We also have a fairly consistent renewal of 81 percent over the course of the last several years, regardless of the rate increases. We also have done a statistical analysis of policyholder participation as related to flooding disasters, and in every instance, we saw a dramatic increase in the number of policyholders just after a flood disaster. There has been reduced flooding activity in the last 2 years, and now that we are seeing an increase in flooding as well as an increase in mortgage activity, we are seeing an increase in the number of participants again. We maintain that the rate increases have not been so substantial as to create a decline in the number of policyholders and believe that the GAO basically supports that premise.

Senator GARN. Well, I am glad somebody understood the GAO report.

Mr. BRAGG. I suppose it is how you look at it, sir.

EMERGENCY FOOD AND SHELTER

Senator GARN. The recently enacted jobs bill—and I put "jobs" in quotes—contained two provisions which provided $50 million each for emergency food and shelter. On April 4, you issued a proposed plan for the State-administered program. Do you believe that the 1-percent limitation on State administrative costs and the September 30, 1983, program expiration date, as contained in the plan, are in accordance with the congressional intent in establishing the program?

Mr. MCLOUGHLIN. Yes, Senator, we do. The law provided for a 2-percent administrative cost. We allowed 1 percent of the administrative cost for State operations and 1 percent then is passed through for local service producers.

Senator GARN. What are your next steps in the process for the State program?

Mr. MCLOUGHLIN. As of April 22, we have completed the execution of agreements with all 57 States and territories, and the States are now in the process of working under the general guidance we provided in the plan with the local community providers in the areas of greatest need. They should have that money out.

Senator GARN. What is the current status of the voluntary agencies program?

Mr. MCLOUGHLIN. The national board has met a number of times. In fact, they are meeting again today. The money, as required by the law, has passed from FEMA to the national board. The United Way is serving as their financial agent. The board expects within the next 3 weeks to make their allocations to the voluntary organizations.

Senator GARN. I simply did not favor setting that kind of a precedent. Frankly, I didn't think that we ought to have aid passed through FEMA in any event, even the State administered program. There was an amendment, at least if you were going to do it, not to put you in the direct business, but give it to the States. And certainly I think it sets a very bad precedent. I am not questioning the need or the credibility of these private agencies, but it disturbs me that we are disbursing that kind of money to private agencies. I think it sets a very bad precedent. And the worst of all, we went in with our $50 million and the House $50 million and accepted both of them. There was no compromise—we will take yours and keep ours, that sort of thing.

SUBMITTED QUESTIONS

In any event, gentlemen, I have, in addition to Senator Huddleston, 51 pages of questions for the record for you to respond to, and I am sure you are relieved I am not going to ask all of them of you today. But we do appreciate your attendance here once again. Senator Weicker also has some questions I would like to submit for the record.

Thank you very much.

[The following questions were not asked at the hearing but were submitted for response for the record:]

QUESTIONS SUBMITTED BY SENATOR GARN

CIVIL DEFENSE FUNDING LEVELS

Question: Last year, FEMA requested $252,340,000 to begin implementing a new civil defense system. That was an increase of $119,086,000 above the 1982 funding level.

The House did not approve the increase requested for the 1983 civil defense program. The House approved the 1982 program level -- $133,254,000.

The Authorizing Committee cut $100 million from your request and the Senate approved $152,322,000 for civil defense in 1983 -- that is $100,018,000 less than requested.

In conference, the House and Senate agreed on $147,407,000 for civil defense activities in 1983. That is a reduction of $104,933,000 below the amount requested.

This year, you are requesting $253,517,000 for civil defense activities in 1984. This is basically the same amount of funding for civil defense activities as you requested last year for 1983.

Mr. Giuffrida, in your statement you say, "At first glance, this request may appear to be a restatement of our 1983 request. I assure you this is not the case."

Has the multi-year plan for civil defense changed since last year?

If so, how does it differ?

What is the total cost of the multi-year civil defense program you are proposing? (Last year, the total cost of the civil defense program was estimated to be $4.2 billion.)

What is the basis for the multi-year cost estimate?

What are the underlying assumptions?

The plan last year was to implement a new civil defense program over a seven-year period. I note that this year you refer to a multi-year plan.

Is the civil defense program still to be implemented over a seven-year period?

If not, over what period of time will it be implemented?

Last year, the $4.2 billion civil defense program was spread over a seven-year period as follows:

1983 -- $252 million
1984 -- $310 million
1985 -- $355 million
1986 -- $400 million
1987 -- $440 million
1988 -- $ 1.2 billion
1989 -- $ 1.2 billion

TOTAL -- $ 4.157 billion

What is your current plan?

Answer: Our multi-year plan has changed since last year in an evolutionary (not revolutionary) fashion, reflecting our new Integrated Emergency Management System (IEMS) approach. This includes putting more emphasis on local and State emergency requirements. Thus IEMS includes more emphasis on "grassroots" needs, with local leaders having a greater role in assessing hazards likely to affect their communities and in specifying the actions to be taken to address the potential hazards peculiar to their communities. Most emphasis will be on multiple-hazard planning and response capabilities.

One example of qualitative changes in the program, under the IEMS concept, is that Radiological Defense Officers will expand their ability to plan for and respond to all types of radiological hazards, such as transportation accidents or other incidents with potential for release of radioactive materials, and accidents at nuclear power plants. Also, the current shelter survey will be broadened to identify protection against hurricanes, tornadoes, and other threats as well as attack effects. Emergency plans will become generic in nature, with plans for emergency evacuation being applicable to all hazards, such as hurricanes, floods, release or threatened release of toxic substances, and possible terrorist incidents, as well as acute international crisis.

The basis for the current multi-year cost estimates is our best current estimate of work-years required for planning, cost of equipment of various types, and related factors. We expect that these cost estimates will change, also on an evolutionary basis, as we gain experience with deploying the IEMS approach. Our underlying assumptions are that domestic disasters of a variety of types occur all too frequently, in jurisdictions throughout the country. In addition, while a nuclear attack is considered very unlikely, it is not impossible. An all-hazards civil defense program of the type called for by Presidential directive and 1980 and 1981 legislative amendments by the Congress will save lives both in domestic disasters and across a wide spectrum of possible nuclear attacks.

Our current plan is as follows through FY 1988 (FY 1984 dollars):

1984 -- $253.5 million
1985 -- $345 million
1986 -- $410 million
1987 -- $500 million
1988 -- $600 million

The program could be completed by end-FY 1989 for $1,956 million. The total would be $4.06 billion (somewhat less than the previous total of $4.157 billion over seven years — which was in FY 1983 dollars — because there would be one year less of relatively fixed overhead costs). The FY 1989 figure is large, compared to the preceding year. However, the great bulk of the increase is for procurement (shelter supplies, radiological instruments), which can be procured in larger rather than lesser quantities -- provided a solid base has been established in prior years for large-scale procurement. The proposed program would provide this base, over several years prior to FY 1989.

We believe that the important issue does not relate to the farther outyears. Rather, it is to get started in FY 1984 on an accelerated, all-hazards program. The IEMS approach will facilitate progress, but the basic problem is one of resources -- which is why we urge approval of the $253.5 million requested.

CIVIL DEFENSE -- OMB REQUEST

Question: I understand that your OMB request for civil defense in FY 84 was $352,481,000.

Why did OMB reduce FEMA's civil defense request by $98,964,000 or 28%?

Answer: We understand that the reason for the OMB reduction was the problem, applicable to all programs of all agencies, of the availability of resources in FY 84. We would have been pleased to have seen the FY 84 request at the higher figure, because of the need to start deployment of an accelerated, all-hazards civil defense program of the type called for both by Presidential directive and the 1980 and 1981 amendments of the Federal Civil Defense Act. However, we understand the necessity of allocating scarce resources among many competing needs and programs.

We believe that the $253.5 million requested for FY 84 will permit substantial progress towards the Presidential and congressional objectives, and will begin rebuilding the credibility of the program among the State and local governments who, in the final analysis, must implement the program. We also anticipate that our new Integrated Emergency Management System (IEMS) approach will strengthen the Federal-State-local partnership specified by the Civil Defense Act.

STATE AND LOCAL EMERGENCY MANAGEMENT

Question: You are requesting an increase of $5,000,000 for State and Local Emergency Management--this is after having received a $5,000,000 increase in 1983. This is a 50-50 Federal/State matching program.

Are any States having trouble coming up with the local match?

Are you confident that the States can match this extra $5,000,000 in FY 84?

How do you currently determine that States really provide at least 50% of the funds to coordinate and manage civil defense activities?

Answer: In FY 1983, all States have submitted the required documentation providing for use of the full amount of their allocations. The States are required to allot two-thirds of their allocations to the local level unless a lesser amount is formally approved by the Regional Director as justified. Thus, approximately $32,000,000 of the $49,000,000 EMA appropriation is being matched by local jurisdictions. In some cases, EMA funds have not been adequate for overhead or travel costs, and thus many local governments and some States pay more than 50% of program costs. Apparently, few if any local governments or States have so far been unable to make the match.

Historically, EMA appropriations have not been adequate to meet State requirements. In FY 84, one of the objectives under State and Local Emergency Management is to increase population coverage by increasing local jurisdiction participation. An increasing number of jurisdictions have been requesting acceptance into the program. Unfortunately, the State allocations do not provide for an expansion of participation without cuts elsewhere. We are confident that funding requests at the State and local government levels will exceed the $54,000,000 requested, including the $5,000,000 increase, in FY 84.

Each State submits an application form showing the nonfederal as well as the Federal share of the requested amount. "Assurances" submitted as a required part of the application certify to compliance with Federal and FEMA requirements, including FEMA regulation 44 CFR 302.5(a)(ii) on the match. A quarterly Financial Status Report shows the nonfederal and Federal shares of outlays, by program and total. State audit requirements are specified by the Office of Management and Budget in Circular A-102 (Revised), Attachment P, which the States agree to observe. These audits, to be conducted at least every 2 years, include compliance with Federal law and regulation. FEMA reviews the State audits and can conduct its own audits.

FEMA CRISIS RELOCATION PLANS

Question: Last year, the central component of the civil defense program was the Crisis Relocation Plans (CRP). As you know, that concept was rejected by the Congress--both in the authorizing and appropriating areas. That plan proposed relocating about 62 percent of the population from attack areas to "host" areas. How have the goals or objectives of the crisis relocation plans changed since last year? Do your long range plans involve less money over the multi-year period for crisis relocation than they did last year?

Answer: In keeping with the intent of Congress as expressed in recent amendments to the Federal Civil Defense Act, FEMA is in the process of implementing an Integrated Emergency Management System (IEMS) approach on programs authorized under that Act. IEMS is designed to build capabilities at the State and local level to save lives in emergencies across the full spectrum. This includes natural disasters such as tornadoes, earthquakes, hurricanes and floods; technological disasters such as release of hazardous materials, accidents involving radioactive materials, including nuclear power plant accidents; resource shortages; and enemy attack.

The potential impact of IEMS is more significant than merely modifying existing Crisis Relocation Plans to take into account all hazard scenarios. Where in the past, evacuation or in-place protection plans had been developed for technological hazards as well as hurricanes, floods, fixed nuclear facilities, etc., we see those plans providing a base for modification to serve other hazard scenarios including nuclear attack. In future starts of evacuation or in-place population protection planning, we intend to implement the various planning assistance activities in a more complementary fashion so as to produce, in one coordinated planning effort, a comprehensive plan that addresses like functions in a generic approach, and distinctly addresses the features that are hazard specific. Thus, funding for what had been solely nuclear attack preparedness planning will contribute to preparedness through planning for all hazards and similarly, other funding and assistance that had been previously delivered specifically for hurricanes, earthquakes, technological hazards, etc., will contribute to preparedness through planning for nuclear attack. By integration of our total effort we are realistically supporting the overall development of a community's emergency capability to save lives regardless of the cause of the event. The capability to protect people also recognizes the only two options available regardless of the hazard, namely, evacuation or seeking shelter in-place. We believe such an approach to be consistent with the Executive and Legislative mandates for the civil defense program to provide an improved ability to deal with natural disasters and other large-scale domestic emergencies.

As for funding levels to complete Population Protection Plans for all jurisdictions over a multi-year period, we do not currently envision any reduction in the out-years to accomplish Population Protection Plans which will now include planning for effects of natural disasters and technological hazards as well as nuclear attack. We do not have any "cost experience" as yet for the impact of the IEMS approach. We anticipate that the savings generated by having one integrated Population Protection Plan for a jurisdiction in lieu of many separate plans for each of the hazards will be offset by the increased planning effort required to include natural and technological hazards. Thus, no reduction in out-year Population Protection Planning program costs is envisioned at this time.

State and Local Assistance Funding for Civil Defense Plans and Natural and Technological Hazards Plan

Question: What justifies the imbalance of funding between civil defense plans ($141,440,000) and the plans for Natural and Technological Hazards latter two programs (a total of $9,176,000) when the hazards covered by the latter two programs have a much higher probability of affecting the population than the threat of a nuclear attack?

Answer: Detailed examination of the civil defense programs for FY 1984 which total $141,440,000 reveals the following:

*	State and Local Emergency Management	$56.140 million
**	Radiological Defense	19.900
**	Population Protection	36.500
*	State and Local Direction, Control and Warning	28.900
		141.440 million

* Provides for 50/50 matching funds
** Includes funds for 100% Federal support

- By law, nuclear attack preparedness is a joint responsibility between the Federal and State and local governments. Of the $141.44 million civil defense total, $85.04 million are earmarked for 50 percent matching funds with State and local governments to provide for personnel and administrative expenses to support a State and local government emergency response capability and for development of emergency operations centers with supporting communications and warning equipment. In addition, $28.9 million is provided for planning support of State Population Protection Planners and Radiological Defense Officers on a 100 percent Federally funded basis. (This latter figure includes support for survey data to identify buildings to be utilized in the plans as well as RADEF operational guidance).

- Therefore, $117.5 million of the $141.440 million total is provided to State and local governments either as 100 percent Federal funding or in 50% matching funds.

- Such direct funding to State and local governments represents a commitment by the Federal Government for attack related responsibilities as mandated by the Federal Civil Defense Act of 1950 as amended.

- Natural and Technological Hazards have historically been the domain of State and local governments rather than a Federal Government responsibility. The $9.176 million figure noted in the question includes $5.587 million for Comprehensive Emergency Preparedness Planning and $3.589 million for Radiological Emergency Preparedness (planning for offsite nuclear reactor accidents). Flood Plain Management funding of $58.6 million was not included in the Natural and Technological Hazards figure.

- While Natural and Technological Hazards have a higher probability of affecting the population, than does nuclear attack, the fact remains that the consequences of a nuclear attack are much greater than any natural disaster in terms of potential loss in lives and property.

Operational Guidance

You testified last year that as part of the Operational Guidance Program, you intended to publish a handbook for radiological monitors assigned to emergency services, vital facilities and essential industries. Was the final draft distributed for comment by September 1982 as planned? When will the handbook be published?

- o A series of handbooks for radiological monitors will be published as part of the Operational Guidance Program.
- o The handbook for radiological monitors assigned to emergency services, vital facilities and essential industries is the second handbook in the series.
- o The first handbook, Radiation Safety in Shelters, a guide for shelter radiological monitors, was the handbook that was to be in final draft and distributed for comment by September 1982.
- o Radiation Safety in Shelters was distributed for comment in July 1982. Several issues were raised dealing with radiation shielding, dose rate measurement techniques, dose distribution and prioritizing radiation sensitivity of the shelter occupants. The issues were referred to the National Council on Radiation Protection and Measurements (NCRP) subcommittee 63 for resolution. The issues have been resolved and a redraft was circulated for comment in February 1983.
- o It is planned to publish Radiation Safety in Shelters by the end of FY 1983.
- o The handbook for radiological monitors assigned to emergency services, vital facilities and essential industries builds on Radiation Safety in Shelters. It could not be developed until the issues concerning Radiation Safety in Shelters had been resolved.
- o Work on the handbook for radiological monitors assigned to emergency services was initiated in February 1983. In consonance with the Integrated Emergency Management Systems concept, that handbook will be more comprehensive and include all radiological hazards, peacetime as well as nuclear attack.
- o It is anticipated that a draft of the handbook for radiological monitors assigned to emergency services will be ready for review and comment by February 1984 and we anticipate publication by the end of FY 1984.

RADIOLOGICAL DEFENSE

Question: If FEMA intends to produce only 20,000 dosimeters at the Rolla plant, why is it going to expend $1.6 million in rent over a 10 year period? What is the capacity of the Rolla plant per shift? Per year? Why is this capacity needed?

Answer: The end objective of pilot production at the Rolla facility is not the production of 20,000 dosimeters. The objective is to have a closely controlled, well monitored, and precisely documented proven production process that can be documented in procurement specifications. Such specifications will assure an open competitive process for the procurement of a low cost reliable dosimeter from the private sector.

The 10 year lease period is not a programmatic requirement. It is based on the economics of leasing as determined by specialists of the General Services Administration (GSA). The substance of their determination as provided by GSA follows:

> The rental of the Rolla, North Dakota, Dosimeter Facility is premised on a return of the building's cost, which translates to value in the case of a special purpose improvement configured and finished to Government specifications. Any owner or developer in leasing such property requires a 100 percent return on improvement cost over the period of the lease. Further, typical Governmental and private sector policies in the area are structured to a 10 year period for industrial property. The term of the lease could vary, but the lease payment terms would vary in like proportion. Since the funding of the building is premised on 10 year subsidized terms, the lease term of 10 years provided maximum leverage (i.e., lowest possible yearly payments) to the Government. The presently proposed lease is structured to provide that beyond the recapture of investment phase of the lease (10 years), the Government's leasehold position can be maintained for 20 additional years at the minimal cost of maintaining the property.
>
> A restructuring of terms to 5 years would almost double the annual lease payment. Premature termination of a 5 year lease could result in higher total costs to the Government than that for a 10 year lease. Extending the term of a 5 year lease, should this be required, would result in higher lease payments.
>
> If the Government's present need for the facility were to cease prematurely, outleasing by the Government for the remaining lease term results in lower costs for the 10 year lease than for a shorter term lease.

The capacity of the Rolla plant is estimated at 150,000 dosimeters per year per shift. This is determined by the capacities of a set of production equipment representative of that to be used in production. This is the minimum capacity needed to simulate a production line.

Senator Garn—Continued

RADIOLOGICAL DEFENSE

Question: In 1979, the Oak Ridge National Laboratory estimated that 10 million radiological instrument sets were needed for population protection from nuclear attack. FEMA's seven year plan called for a total of seven million sets and more recent FEMA estimates 5.5 million will be produced. What is your latest estimate of the number of instruments sets to be produced and how was this arrived at?

Answer: Our planning estimate is seven million sets. It is based on the 1980 estimated population of 220 million people. It is based on the needs for use in public shelters and for postattack recovery upon emergence from shelter.

We are currently developing guidance on the use of instruments in shelter and postattack recovery situations. When approved, this guidance will be used to further refine quantitative, and performance and reliability requirements for radiological instruments.

Question: FEMA officials have estimated current instrument costs at $100 each. Technological breakthroughs in set design will be required before FEMA can reduce the per set cost to the $30 range. What progress has FEMA made toward achieving the additional breakthroughs required?

Answer: Radiation ratemeter designs similar to those currently in the FEMA inventory would cost over $100 each if procured today. Their costs in FY 1962 were in the $20 range. Because of this, FEMA proposes to use a dosimeter/timer combination for the ratemeter in the shelter sets. Using this approach, a shelter set in the $30-$40 range is considered attainable. Meeting this cost objective depends upon starting, in FY 1983, the scheduled pilot production effort in the William Langer Jewel Bearing Plant. During this phase potential mass production problems will be solved and engineering solutions applied to reducing costs.

The cost would go even lower if we are able to use a radiochromic waveguide dosimeter in the shelter sets. This new concept is in the early developmental phase and requires considerable testing before it could be considered. The potential cost savings are very significant if this approach is successful.

A ratemeter which gives dose rate instantaneously (true ratemeter) is considered more appropriate for postattack recovery operations. A technological breakthrough is being sought to attain a low cost instrument of this type. The cost of such an instrument would be greater than the dosimeter/timer combination but much less than the current model. Top scientists from the United States Army Electronics Research and Development Command, Oak Ridge National Laboratory and the National Bureau of Standards are working on this project with FEMA. Preliminary feasibility models have been constructed for test and evaluation.

RADIOLOGICAL DEFENSE

Question: What assurance does FEMA have of the accuracy of State Radiological Instrument Inventories and the adequacy of State Instrument Distribution Plans in the event of a nuclear attack crisis? What verification and/or review has been performed?

Answer: The total value of Radiological Instruments purchased and granted to the States was in excess of $50 million (1962 $). A total 5,626,194 individual items of RADEF equipment have been procured, of that total, 4,300,000 instruments comprise today's inventory. Under terms of the FEMA and State Comprehensive Cooperative Agreements (CCAs), inventory controls are maintained by federally funded State maintenance and calibration (M&C) facilities. There is a requirement under the CCAs that each State submit an annual inventory to FEMA on the total number of instruments distributed throughout the State. Inventories are conducted by the on-site exchange and recalibration of State and local instrumentation. Annually, twenty-five percent (25%) of the State and local inventory of instruments is serviced by State M&C technicians.

Instruments are stored at State and local levels of government. At the State level, instruments are stored at State Maintenance and Calibration Facilities. At the local level, instruments are stored in local bulk storage repositories. Plans exist for the distribution of instruments during a crisis to individual shelter locations. In view of the fact that instrument deployment plans have not been tested by the States in an actual exercise, it is difficult to make a judgment on the adequacy of these plans.

Question: I am informed that FEMA has lost most of its records indicating the status, location and training received by individuals attending the Emergency Management Institute prior to 1980 and FEMA still has no central information system to record this information. Based on this, how can FEMA accurately forecast training needs and determine the status of its efforts to establish a large cadre of Radiological Defense Officers?

Answer: Training records for individuals are no longer maintained at National Headquarters. However, the number of individuals who have completed RADEF training has been available through the computerized Program Status Report (PSR) that reflected RADEF program data for State and local jurisdictions. In view of the fact that OMB has disapproved use of this document in accordance with the Paperwork Reduction Act, future maintenance of this data base is questionable. However, State and Regional Training and Education Officers have traditionally maintained RADEF training course completion records.

The fully funded State Radiological Defense Officer (RDO), as a part of his management responsibilities, identifies training requirements as a normal activity of the planning process. At a minimum, there should be at least two trained RDOs to provide 24 hour capability in each of the 5,679 jurisdictions in the nation.

Senator Garn—Continued

Positions for Population Protection

Question: You are requesting 144 positions for the population protection program in 1984. This is 32 above the number of positions you requested last year for 1983. What specific skill and qualifications are you looking for in these 32 positions? Please provide a listing of the entire 144 positions by academic training or background.

Answer: The 32 position increase over that requested for FY 1983 is needed primarily to keep pace with the expanded effort for the Population Protection Planning program element projected for FY 1984.

- The Population Protection Planning program element increases from 8.7 million in FY 1983 to $13 million in FY 1984 with the addition of 170 State planners to the 205 planners currently authorized. This expanded effort will necessitate a significant increase in FEMA Regional workload in monitoring the State planning effort, review plans developed by State and local jurisdictions for conformance to Standards and Criteria, and to observe tests and exercises to demonstrate a performance capability.
- Of the 32 positions requested, 28 are to be allocated to FEMA Regions and 4 are to be assigned to FEMA Headquarters.
- The 32 positions will be distributed in grades GS 9, 11, 12 and 13 generally as Emergency Management Specialists, Community Planner, or Program Analyst.
- Direct skills, experience, and qualifications include the following:
    - Familiar with State and local government emergency mangement systems
    - Experience in disaster planning and emergency operations
    - Ability to review plans, reports, documents, etc. and make comments
    - Develop priorities and planning projections
    - Experience in conduct of tests and exercises
    - Ability to collect and analyze data
    - Assess State planner training needs and requirements
    - Participate as member of Region Emergency Response Team
    - Coordinate with States and Regional offices of other Federal agencies
    - Ability to make presentations to State and local officials
    - Review and negotiate Comprehensive Cooperative Agreements
- It is not possible within the time allotted to provide a list containing the academic training and background for each of the 144 positions as requested. Generally, the positions fall into three program elements as follows:

	No. of Positions		
	HQ	Regions	Total
Population Protection Planning	13	45	58
Facility Survey, Engineering and Development	16	68	84
Shelter Preparation	1	1	2
	30	114	144

o Personnel involved in Population Protection Planning will generally have skills and qualifications similar to those presented earlier. Personnel involved in Facility Survey, Engineering and Development will have a more technical background such as engineering or architecture and become involved in programs such as survey of buildings to identify inherent shelter features, and shelter design and development.

COST OF SURVEYING INDIVIDUAL SHELTER FACILITIES

Question: Last year, we discussed the cost of surveying an individual facility. You stated that the cost would increase from $17 per survey in 1982 to $27 per survey in 1983. What was the average cost per survey in 1982? Is the 1983 average cost per survey still $27? What do you estimate will be the average cost per survey in 1984?

Answer: In FY 82, we surveyed a total of 163,000 facilities in reception (host) areas and 3,600 facilities in risk areas. The cost to survey these facilities was $3,559,000 for an average cost of $21.00 per facility surveyed. This cost includes student surveyors and Corps of Engineers administrative support costs, Regional in-house supervisory personnel costs and the State contract with South Carolina.

-- The cost breakdown is:

  - Approximately $3,484,000 for 100 FTE college students and Corps of Engineers administrative support costs plus FEMA Regional in-house student supervisory costs.

  - $75,000 South Carolina State contract.

In FY 83, there is no administrative support from Corps of Engineers for the college student survey program. The surveys are being accomplished in the following priority:

-- By contracting with States (about 26) through the CCA to conduct surveys;

-- College student effort (50 FTE) supervised by the FEMA Region in-house staff;

-- By contracting with the private sector to accomplish surveys where needed.

-- It is estimated that a total of 197,000 facilities will be surveyed. The estimated cost to survey these facilities is $5,574,600 for an average cost of $28.30 per facility instead of the previously estimated cost of $27.00 per facility.

-- The increase in cost per facility, compared to FY 82, is due to the management decision of involving States and some private sector firms in conduct of surveys. It is known to be a more expensive approach, however, it is offset by providing increased involvement of the States in performance of the work, thus, decentralizing program management to the States.

In FY 84 the shelter surveys will be broadened to include data necessary for all-hazard population protection planning. The survey procedures are under development and until the survey procedures are developed, an accurate estimate of survey cost and productivity cannot be made. It is our intention to give top priority to State contracts, supplemented by some in-house Regional effort with college students, and lowest priority to contracting with private sector firms. In this manner, cost will be kept to the lowest possible amount while still meeting the objective of decentralizing management responsibilities to the States. It is planned to utilize State contracts (about 40), a 50 FTE FEMA student effort supervised by the Regional in-house staff and where necessary contracting with the private sector.

CIVIL DEFENSE - LOCAL EMERGENCY OPERATING CENTERS

Question: FEMA's plans for a revitalized civil defense originally estimated that 5,633 local emergency operating centers were needed. This number was developed essentially by totalling the number of local governments reporting a civil defense organization. What steps has FEMA taken to more precisely determine the number, location and cost of the local emergency operating centers needed?

Answer: FEMA is letting a contract in the 3rd quarter of FY 83 to more precisely determine the national EOC requirements, including number and location. The costs of EOCs will be determined by the number of jurisdictions deemed to have an EOC requirement based on the findings of this study, and on the deficiencies in existing facilities that require upgrading to meet FEMA's standards. Regardless of the outcome of the study, funds presently requested will provide only a start towards meeting current, verified requirements.

Question: How many State, State area and local emergency operating centers do you now believe are needed?

Answer: Previously projections by State and local governments indicated about 6,000. However we believe our estimates will be much more accurate after the previously mentioned study is completed.

Question: How many of each of these facilities do the State emergency operating center development plans indicate the States currently plan to build or upgrade?

Senator Garn—Continued

Answer: The EOC Development Plans project the planning and designing of 206 new projects, and the upgrading of 1,792 existing EOCs between FYs 83 and 89. These estimates will be significantly increased in the outyears as State and local projections become more sophisticated. When we add the 124 facilities presently meeting FEMA minimum standards, a total of 1,916 will meet standards based on EOC Development Plans.

These figures do not reflect State and local decisions to allow some existing EOCs that have some operational features to continue to be counted as part of their overall direction and control capacity; but will not be upgraded to meet FEMA's standards.

Question: I understand that some State and local governments are unable to provide matching funds for even high priority projects identified in their development plans. Wasn't FEMA forced to reallocate matching funds for developing emergency operating centers from five FEMA Regions in FY 1982 in order to avoid returning these funds to the Treasury?

Answer: FEMA allocates funds to Regions based on projected EOC requirements as reflected in EOC Development Plans. This allocation precedes the Regional receipts of project applications. Should an anticipated project not materialize due to State or local legislative action, or failure to appropriate or obtain funds, the funds must be allocated elsewhere. Such reallocation is accomplished simply by going to another priority, wherever the next higher priority exists. Because of the backlog of project requirements, such allocations are easy unless time does not permit it administratively.

During the three years (FYs 81, 82, and 83) of the new EOC program, States and localities have not evidenced to FEMA any reluctance to match the Federal funds available for EOCs. In fact, States have asked for over a quarter of a billion dollars in EOC funds. This sum is all the more interesting due to the absence of any advertising or salesmanship about the program by FEMA.

Question: FEMA presently does not routinely inspect emergency operating centers or broadcast stations participating in the Broadcast Station Protection Program, nor does it systematically monitor the status of these facilities and programs. Why doesn't FEMA perform these functions so as to better identify deficiencies, take corrective actions and perform program planning functions?

Answer: FEMA conducts periodic inspections based on available manpower and technical capability to do so. Routine inspections, while desirable, are not possible at this time, based on the present level of funding for the program.

CIVIL DEFENSE - LOCAL EMERGENCY OPERATING CENTERS

Question: Important civil defense policy guidance, such as the national plan and principal guidance affecting Emergency Operating Center and Broadcast Station Protection Program facility development, continues to be badly outdated and of limited use. FEMA began efforts to update the national plan shortly after being formed in 1979, and local and State governments often cite the lack of updated guidance as a principal reason for giving civil defense a low priority. What do you intend to do in FY 84 to improve and update your program guidance?

Answer: The Emergency Operating Center guidance was revised in FY 1981 and published as Civil Preparedness Guide 1-3, Change 3, Chapters 5 and 7. It was again revised in FY 1983. In addition, CPG 1-20, which is an EOC handbook designed to provide information across the board to persons interested in EOCs and EOC development, is presently being prepared. The operational section will be published by the 4th quarter of FY 1983, with a technical section following in FY 1984.

Technical guidance on the Broadcast Station Protection Program is currently being revised and will be issued during FY 1983.

FEMA is establishing a new, comprehensive series of guidance documents which will serve as a basis for all mobilization preparedness planning at the Federal, State and local levels.

Consistent with FEMA's Integrated Emergency Management System (IEMS), the preparedness programs covered by the new series of documents will reflect the full range of national security and domestic emergencies, as provided for in National Security Decision Directive (NSDD) 47, "Emergency Mobilization Preparedness." The documents will cover the respective responsibilities of Federal departments and agencies, State and local governments, and the private sector. Material from the National Plan will be incorporated into the new documents, as appropriate, and the National Plan will be superceded.

It is expected that the majority of Federal Preparedness Circulars (FPCs), which will be key documents within the series, will be published by October 1, 1983, and reviewed and revised as necessary on an annual basis.

ELECTROMAGNETIC PULSE PROTECTION

Question: A number of facilities will require Electromagnetic Pulse (EMP) protection. What will it cost to protect these facilities and resources from EMP? Over what period of time do you intend to carry out this protection program?

Answer: Briefly, the EMP element in the budget provides funds for the purchasing and shipping of EMP devices and parts.

It supports the:

-- Broadcast Station Protection Program (BSPP) which provides protection to EBS stations.

-- Emergency Operating Center (EOC) program by protecting communications and emergency electrical power (generator) systems.

-- Warning and Communications Systems (WCS) program by protecting Statewide communications systems.

EMP funds do not provide for the installation of EMP devices.

Installation costs are provided for by the program supported (i.e., BSPP, EOC, WCS).

Our EMP status and requirements are as follows:

	BSPP	EOC	Statewide Commo Sys.
Total no. required	2,771*	5,950*	54
Completed	609	110	1
Remaining	2,162	5,840	53
Cost per unit	$2,000	$4,000	$50,000**
Total cost FY 84-89	$4,324,000	$23,360,000	$2,650,000

* These numbers are estimates. The BSPP and EOC requirements are undergoing a thorough analysis. We do not expect there will be a substantial change.

** This is a very rough estimate. This will be improved within a year as further study and experience is gained.

EMERGENCY INFORMATION AND COORDINATION CENTER

Question: Last year, you requested $1,200,000 for construction of the Emergency Information and Coordination Center. You indicated that construction will begin by December 1982. What is the present status? How much have you requested for this purpose in FY 84?

Answer: In November of 1982, final design plans for the Emergency Information and Coordination Center (EICC) facility were delivered by the Federal Emergency Management Agency to the General Services Administration (GSA). GSA approved the plans and conducted an Independent Government Estimate of the project before requesting the Donohoe Company to submit a proposal for construction. Donohoe submitted its proposal on February 23, 1983, and GSA completed a preaward audit of the project on April 1, 1983. The project is now in the negotiations phase. GSA expects to conclude negotiations and award the construction contract by May 18, 1983. Construction will begin immediately thereafter, and should be completed by October 31, 1983. The 1984 request contains $500,000 for this purpose.

HAZARD MITIGATION ASSISTANCE

Question: The Goal of this hazard mitigation assistance program is to enhance the capabilities of State and local governments in multi-hazard mitigation planning.

During last year's hearing, you stated that FEMA would develop a mitigation assistance handbook for use by State and local governments.

Do you still expect to publish this plan in September 1983?

Answer: No, this handbook will not be published until the third quarter, fiscal year 1984 due to FEMA's involvement in the permanent relocation of the residents of Times Beach, MO.

SAFETY OF DAMS

Question: Your budget justification states: "There are over 67,000 dams in this country, about 20,000 of which constitute a high hazard to the health and safety of the public, 2,000 of which are unsafe, and about 150 of which required emergency actions"?

How many of the 67,000 dams are Federal and how many are non-Federal?

What is being done regarding the 2,000 dams which are unsafe?

What is being done regarding the 150 dams which require emergency action?

Are any Federal dams unsafe? If so, what is being done to make those dams safe?

Answer: At the close of the National Program of Inspection of Dams (PL 92-367), completed in September 1981, there were over 68,000 dams identified in the inventory. About 3,000 Federal dams were identified for the inventory and were inspected. None were considered to be emergency unsafe. "Emergency Unsafe" was a term used in the inspection program to identify the condition of a dam where failure was judged to be imminent and immediate action was required to eliminate or reduce the danger. However, several Federal dams were considered to have safety deficiencies which warranted rehabilition efforts of varying urgency. About 200 dams fall into this category. All of the agencies are vigorously pursuing programs to upgrade their unsafe dams consistent with existing budgetary constraints.

Funding for the National Program of Inspection of Non-Federal Dams expired September 1981. Thus no update or

Senator Garn—Continued

corrections of the inventory have taken place. However, through the courtesy of some of the States in which the 150 emergency unsafe dams where located, we have obtained sufficient qualitative information to state that most of these dams have been repaired or breeched.

Of the remaining 2,000 dams identified as unsafe, only about 14 of the States in which these dams are located have adequate dam safety programs and staff. However, most are attempting to achieve the upgrading of the unsafe non-federal dams, although they are severely hampered by lack of funding. Similarly, dams publicly owned are awaiting funding before repairs can be achieved. At the close of the inspection program, the Corps of Engineers specifically recommended that any Federal funds for remedial measures should be targeted to these publicly owned structures. However, no such funding program currently exists.

EARTHQUAKE PROGRAMS

Question: You are requesting $3,705,000 for state and local assistance in your earthquake program. This is an increase of $585,000 above the FY 1983 level.

Is this money going directly to the states for earthquake activities?

In addition to the $3,705,000 requested for the FY 1984 earthquake program under the state and local assistance appropriation, how much is being requested in other FEMA accounts?

Provide for the record a table showing total Federal government resources devoted to the earthquake program for 1982, 1983 and 1984.

Answer: Of the $3,705,000 requested, $2,050,000 will be provided to the states for state and local preparedness planning; $350,000 will be directed toward public education and research utilization, which includes funding of state and local earthquake information centers, workshops, development and dissemination of audio-visual and textual materials for state and local use and public outreach programs. The remaining $1,305,000 is designated for activities related to seismic construction standards and seismic building code development.

There are no additional funds being requested in other FEMA accounts for the earthquake program. The $3,705,000 represents the total FY 84 outlay for the earthquake program.

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There follows a table showing total Federal government resources devoted to the earthquake program for 1982, 1983 and 1984.

Total Government Resources Devoted To The Earthquake Program in 1982, 1983 and 1984

Federal Earthquake Funding
(Dollars in thousands)

	1982	1983	1984
	Appropriation		Administration Request
TITLE 1-EARTHQUAKE			
FEMA	$533	$1,137	$1,305
USGS	32,652	34,500	29,500
NSF:			
Engineering	18,200	17,300	19,000
Earth sciences	7,100	7,500	8,300
Total NSF	25,300	24,800	27,300
NBS	475	475	...
Subtotal	58,960	60,912	58,105
Title II-MULTIHAZARD PROGRAM			
FEMA-evaluation studies	...	$388	$350
FEMA-earthquake emergency preparedness	$525	1,595	2,050
Subtotal	525	1,983	2,400
Total	59,485	62,895	60,505

CALIFORNIA EARTHQUAKE

Question: Last year, you told us that the Resource Preparedness staff intended to complete the initial phase of a joint FEMA/DOD project to determine the national security implications of a major California earthquake during FY 83. What is the current status of Phase I?

Answer: A classified joint Federal Emergency Management Agency/Department of Defense report was submitted to the National Security Council last year. This report explains what damage a serious earthquake might do to the plant and equipment of prime defense contractors and consequent effect on their ability to supply defense needs.

Senator Garn—Continued

PROJECT DELTA

Question: Last year, I questioned you about Project Delta, which will combine the application forms of four highly used programs -- Temporary Housing, Home/Personal Property losses, Flood Insurance and Grants. Could you please bring us up-to-date on this project and indicate the major milestones during FY 83 and FY 84?

Answer: As you are aware, the goal of Project Delta is to restructure and simplify the process through which the Federal government implements its disaster relief programs for individuals by identifying common functions which can be shared and by developing operating procedures for the performance of those common activities.

The project includes the major programs of Individual Disaster Assistance:

- Temporary Housing (FEMA)
- Individual and Family Grants (FEMA)
- National Flood Insurance Program (FEMA)
- Home and Personal Property Disaster Loans (Small Business Administration)
- American Red Cross

Representatives of these five participating programs are on the Delta team to assure that the requirements of their respective agencies and programs are met.

The objectives the project is pursuing are:

1. lessening the ordeal of the disaster victim as much as possible but not to the point of discouraging applicant initiative in taking steps toward self help.

2. providing all of the assistance to which the applicant is entitled but without duplicating benefits.

3. reducing paperwork as much as possible while meeting requirements necessary to make realistic program determinations and to account for expenditures.

4. treating all applicants equitably but providing for priority attention to those needing emergency assistance.

5. providing the assistance as economically as possible but not in haste and not without considering the applicant's readiness to accept assistance and the costs involved.

6. providing the assistance as economically as possible but without jeopardizing the quality and speed of service.

7. providing an automated data processing system which responds to applicant inquiries, supports management information requirements and facilitates processing.

Senator Garn—Continued

The status of Project Delta is as follows. After a thorough problem analysis, a variety of operational alternatives were proposed to the participating agencies, both to the users in the field and to the headquarters program managers. Based on their input, a work plan calling for the development of fifteen separate and distinct end products was drawn up. The end products have been and are continuing to be developed, and will be tested in separate components prior to making large scale changes to the disaster assistance delivery process.

The products developed by Project Delta include:

1. a revision to the public information policies and procedures to better prepare the disaster victim to deal with the various assistance providers.
2. a revamped disaster assistance registration and application forms and process, which should greatly reduce time and paperwork for the disaster victim as well as the assistance providers.
3. three different procedures which are designed to reduce or eliminate duplicative visits to damaged properties.
4. computerized disaster assistance application procedures which should yield significant time and cost savings and reduce the possibility of duplication of benefits.

The first field tests of these products have begun and will continue through September, 1983, given the occurrence of disasters of a size and type conducive to field testing. In the current disaster declaration in Louisiana, Project Delta is conducting a field test involving sharing verification information between the National Flood Insurance Program, the American Red Cross, and the Temporary Housing Program. The objective is to reduce duplicate inspections of damaged properties by these programs, and thereby reduce costs, reduce the burden on disaster victims, and speed up processing. Additionally, in the current declarations in Mississippi and Louisiana, a procedure is being tested which provides verification information to assistance providers regarding flood insurance coverage in force for applicants for assistance. The procedure replaces part of the old manual procedure with automation. It is expected that this will speed up information sharing.

It is anticipated that recommendations for changes to the disaster assistance delivery process based on these field tests will be made in the first half of FY 84.

Senator Garn—Continued

COMMUNITY DISASTER LOANS

Question: As part of the Disaster Relief Program, local governments may be eligible to receive Community Disaster Loans. If the local government's revenues for three years following receipt of the loan are insufficient to meet operating budgets, a community may not be required to repay the loan. Please provide a list of the communities having outstanding loans under this program, those who have paid off their loans and any loan cancellations.

Answer: There have been 14 loans totaling $6,963,509.00. The Table attached provides details concerning loan activity.

Senator Garn
(Continued)

COMMUNITY DISASTER LOAN LISTING (Section 414, PL 93 288)

Fiscal Year	Loan Number	Local Government Applicant	Amount Obligated	Amount Disbursed	Promissory Note			Principal Cancelled	Repayment Due		Repaid
					Date	Rate	Term		Principal	Interest	
1977	505-1	Madison County, ID	$375,000	$275,000	8/30/76	7 1/4	4	* $0	$275,000		
"	505-2	City of Rexburg, ID	260,000	260,000	8/30/76	7 1/4	5	* 0	260,000		(a)
"	505-3	Freemont County, ID	321,409	300,000	8/30/76	7 1/4	4	* 0	-	-	$394,315
"	505-4	Bingham County, ID	854,000	0	8/31/76	7 1/4	0				
1978	531-5	City of Williamson, WV	127,000	127,000	11/8/77	7 1/8	5	* 0	127,000		(a)
"	531-6	Town of Matewan, WV	12,000	7,000	11/8/77	7 1/8	3				
1979	546-7	Town of Hull, MA	1,369,000	785,108	10/27/78	8 3/8	5				
"	537-9	City of Johnstown, PA	1,680,000	1,680,000	10/31/78	8 3/8	4	* 0	1,680,000		(a)
"	537-10	Franklin Boro, PA	50,000	50,000	6/8/79	9 1/2	3				
"	537-11	Dale Borough, PA	47,000	47,000	12/31/79	11 5/8	3				100,000
1980	598-12	Town of Gulf Shores, AL	255,100	255,100	10/5/79	9 5/8	4				
"	598-13	City of Prichard, AL	1,540,000	1,540,000	10/15/79	9 5/8	3				
"	598-14	Water Works Board, Gulf Shores, AL	44,000	44,000	11/19/79	10 3/8	3				
1981	638-15	Town of Hurtsboro, AL	29,000	29,000	5/28/81	13 3/4	3				
		Total	$6,963,509	$5,399,208				$0	$2,342,000	-	$494,315

(a) - Appealed

* Applied for Loan Cancellation

COMMUNITY DISASTER LOANS

Question: How many communities will not have to repay loans?

Answer: To date there have been five requests for loan cancellation processed and in all cases there was no basis for cancellation. This determination was appealed (see Table). The final number of loan cancellations is contingent upon local government requests for loan cancellation and a review of the application and supporting documentation. The basis for loan cancellation is that revenues of the local government during the three fiscal years following the disaster are insufficient to meet the operating budget of that local government because of disaster-related revenue losses and additional disaster-related municipal operating expenses.

Senator Garn
(Continued)

COMMUNITY DISASTER LOAN LISTING (Section 414, PL 93 288)

Fiscal Year	Loan Number	Local Government Applicant	Amount Obligated	Amount Disbursed	Promissory Note Date	Promissory Note Rate	Promissory Note Term	Principal Cancelled	Repayment Due Principal	Repayment Due Interest	Repaid
1977	505-1	Madison County, ID	$375,000	$275,000	8/30/76	7 1/4	4	* $0	$275,000		
"	505-2	City of Rexburg, ID	260,000	260,000	8/30/76	7 1/4	5	* 0	260,000		(a)
"	505-3	Freemont County, ID	321,409	300,000	8/30/76	7 1/4	4	* 0	-	-	$394,315
"	505-4	Bingham County, ID	854,000	0	8/31/76	7 1/4	0				
1978	531-5	City of Williamson, WV	127,000	127,000	11/8/77	7 1/8	5	* 0	127,000		(a)
"	531-6	Town of Matewan, WV	12,000	7,000	11/8/77	7 1/8	3				
1979	546-7	Town of Hull, MA	1,369,000	785,108	10/27/78	8 3/8	5				
"	537-9	City of Johnstown, PA	1,680,000	1,680,000	10/31/78	8 3/8	4	* 0	1,680,000		(a)
"	537-10	Franklin Boro, PA	50,000	50,000	6/8/79	9 1/2	3				
"	537-11	Dale Borough, PA	47,000	47,000	12/31/79	11 5/8	3				
1980	598-12	Town of Gulf Shores, AL	255,100	255,100	10/5/79	9 5/8	4				100,000
"	598-13	City of Prichard, AL	1,540,000	1,540,000	10/15/79	9 5/8	3				
"	598-14	Water Works Board, Gulf Shores, AL	44,000	44,000	11/19/79	10 3/8	3				
1981	638-15	Town of Hurtsboro, AL	29,000	29,000	5/28/81	13 3/4	3				
		Total	$6,963,509	$5,399,208				$0	$2,342,000	-	$494,315

(a) = Appealed

* Applied for Loan Cancellation

Senator Garn—Continued

COMMUNITY DISASTER LOANS

Question: What is the interest rate charged for these loans?

Answer: The interest rate is the rate determined by the Secretary of the Treasury in effect on the date that the loan is executed. This Treasury rate takes into consideration the current average market yield on outstanding marketable obligations of the United States with remaining period to maturity adjusted to the nearest 1/8 percent. The loan is for three years but may be extended to ten. When a final determination is made and cancellation is denied, a Bill for Collection is issued, currently with an interest rate of 13 percent.

Question: How many loans have been or are in the process of being repaid?

Answer: One (1) loan, County of Fremont, Idaho, has been repaid in the amount of $394,315.00 ($300,000 principal and $94,315 interest). In addition, the Town of Gulf Shores, Alabama, has voluntarily prepaid $100,000 of its $255,100 loan.

DISASTER PREPAREDNESS IMPROVEMENT GRANTS

Question: Disaster Preparedness Improvement Grants are provided to States on 50/50 matching basis and are used for improving, maintaining and updating the State's Disaster Assistance plans. The maximum a State can receive is $25,000.

Please provide for the record the amount that each State received in FY 81 and FY 82.

Answer: Several grants in FY 81 were for less than the maximum in order to adjust the grant period to the Federal fiscal year, since the Improvement grants were to be included in the FY 82 Comprehensive Cooperative Agreements. Twenty-five States received and spent the full $25,000. Ten received no FY 81 funding. In FY 82, 44 States were awarded the full amount and only five declined to participate. Amounts per State for each year follow:

Alabama	25,000	25,000	New Jersey	-0-	25,000
Alaska	25,000	25,000	New Mexico	6,250	25,000
Arizona	25,000	25,000	New York	25,000	25,000
Arkansas	6,000	25,000	North Carolina	25,000	25,000
California	25,000	25,000	North Dakota	25,000	25,000
Colorado	6,250	25,000	Ohio	6,250	25,000
Connecticut	6,249	25,000	Oklahoma	6,250	25,000
Delaware	-0-	25,000	Oregon	-0-	-0-
Florida	25,000	25,000	Pennsylvania	25,000	15,630
Georgia	11,000	25,000	Rhode Island	10,415	25,000
Hawaii	25,000	25,000	South Carolina	25,000	25,000
Idaho	24,000	25,000	South Dakota	-0-	16,069
Illinois	-0-	15,500	Tennessee	25,000	25,000
Indiana	-0-	-0-	Texas	-0-	-0-
Iowa	-0-	-0-	Utah	4,000	25,000
Kansas	25,000	25,000	Vermont	6,250	25,000
Kentucky	18,750	25,000	Virginia	25,000	25,000
Louisiana	6,250	25,000	Washington	25,000	25,000
Maine	8,333	25,000	West Virginia	6,250	25,000
Maryland	25,000	18,750	Wisconsin	25,000	25,000
Massachusetts	6,249	25,000	Wyoming	25,000	25,000
Michigan	12,000	-0-			
Minnesota	6,250	25,000	Am. Samoa	25,000	25,000
Mississippi	25,000	25,000	Dist. of Col.	25,000	25,000
Missouri	25,000	25,000	Guam	-0-	17,831
Montana	6,250	25,000	No. Marianas	25,000	25,000
Nebraska	22,500	11,987	Puerto Rico	25,000	25,000
Nevada	-0-	15,000	Virgin Is.	25,000	25,000
New Hampshire	6,250	25,000	Trust Terr.	25,000	25,000

PUBLIC ASSISTANCE

Question: Under the Disaster Relief Program, Public Assistance grants can be made for State and local governments for the repair and restoration of damaged public and certain private non-profit facilities, removal of debris and the installation of emergency protective measures. Last year, you noted that in FY 83 you intended to implement cost-saving measures dealing with Public Assistance grants. What cost savings do you expect to realize as a result of these changes?

Answer: Some of the cost savings which we anticipate are primarily in the area of program administration through reducing or eliminating manual processing, eliminating duplicate files, and reducing processing time, as a result of current efforts in program automation.

We have been pursuing an active program of hazard mitigation under Section 406 and 44 CFR 205, Subpart M, for public assistance projects which produce future savings through avoidance of future damage. For example, as a condition for receiving disaster assistance to restore a damaged portion of a facility upgraded to current codes, specifications and standards, the applicant would be required to upgrade, at non-Federal expense, certain other features to make the entire structure disaster resistant. While this approach may result in a modest increase in current costs, there is a significant benefit achieved in avoiding future costs to restore the structure in subsequent disasters.

A contract for Standby Technical Assistance is used to review large, unusual, high dollar value, or complex projects of local governments that have been damaged by a disaster when FEMA and other Federal agencies do not have the specialized expertise. Some of these projects that the contractor has reviewed are: (1) Marshall Wharf Building destroyed by the Lynn, Massachusetts fire, (2) old brick sewer system damaged by the Ft. Wayne, Indiana flooding, (3) ocean piers in Florida and California damaged by wave action and (4) bridges and a sewage treatment plant in Arkansas damaged by flooding. We estimate that the savings from these contractual services during FY 1983 at over $6,000,000.

Floodplain management actions under Executive Orders 11988/11990, as implemented by 44 CFR Part 9 have included thorough review of permanent repairs or restorative work in the base floodplain. This complements the National Flood Insurance Program and assures proper flood hazard mitigation measures for FEMA funded disaster assistance. Some structures have been relocated outside the base floodplain; others have been floodproofed and, when no practicable alternative exists, FEMA grant assistance may be denied. During 1983, we have no current figures on cost savings due to these actions. However, most additional costs will be at non-Federal expense and the savings will be primarily in avoidance of future flood damages.

PURCHASE OF PROPERTY

Question: Section 1362 of the National Flood Insurance Act of 1968, as amended, authorizes the purchase of flood damaged structures for permanent removal from flood risk areas. Purchased properties are then transferred by sale, lease or donation to the State or local government that agrees to accept the properties to open space use restrictions.

In FY 83, you intend to purchase 87 properties for a total cost of $4,778,000.

How many properties have you acquired to date in FY 83?

Answer: To date FEMA has acquired three properties, (total cost $209,600), has 12 signed contracts, (totaling $251,976), and is committed to purchase another 143 structures (in a total amount of $4,276,313) prior to the end of the Fiscal Year.

Senator Garn—Continued

Question: What are your estimates for FY 84?

Answer: The projected total for next Fiscal Year is 95 properties.

PUBLIC ASSISTANCE

Question: What type of initiatives are you actually undertaking?

Answer: We automated the Public Assistance Program and concurrently eliminated the need for the submission of voluminous project files to Headquarters, FEMA. Grants to States and local governments (Project Applications) are based on a series of individual projects (Damage Survey Reports, DSRs) prepared by Federal and State Engineers who survey and document disaster damage. Each report (DSR) is reviewed by FEMA Regional personnel prior to FEMA approval and funding. There may be over 10,000 DSRs in a single disaster; the value of a DSR may vary from $250 to over $1 million. Individual projects require mitigation, environmental or insurance considerations, and larger projects may take over five (5) years to complete. Earlier efforts had resulted in automation of the Project Application and Financial Management Process. The current automation of individual projects (DSRs) enables FEMA to improve management and focus on projects and program areas requiring special attention.

A Task Force has been designated to substantially revise and update the automated procedures to satisfy regional and national program requirements to include incorporation into the system of a single line item Damage Survey Report/Project Application (DSR/PA) concept by FY 1983 and development of a Data Base Management System in FY 1984.

We have completely reviewed and updated the regulations applicable to Public Assistance. We also revised and published updated handbooks to implement these FEMA regulations.

Specialist training has been conducted for reservists who may be assigned to administer public assistance program during declared major disasters or emergencies.

A Fire Suppression Conference will be held under Section 317, PL 93-288, during 1983 before the annual fire season. Critiques and program reviews or evaluations are continuing functions.

AUTOMATED DISASTER MANAGEMENT INFORMATION SYSTEM

Question: During FY 82, the ten-year old automated disaster management information system was converted to the data base management system. What is the difference between these two systems? Why was it necessary to change management systems?

Answer: The conversion was begun in FY 1981 and completed in FY 1983. This was a change in an information system, not a change in management systems. The new information system differs from the old one in three ways:

(1) Data entry is controlled more carefully, so errors are reduced to a minimum; (2) data are stored more efficiently, requiring less computer memory; and (3) reports are clearer, more flexible, and provide more useful information.

DISASTER RELIEF

Question: You are requesting $6,260,000 for the management and administration of the Disaster Relief Program. What are the current FY 83 staff levels in the Disaster Relief Program? What are your estimates for FY 84?

Answer: The current staffing level (Permanent Full Time Positions) in Disaster Assistance Programs is 144; no change is proposed in FY 1984. The proposed staffing level will remain 144, with 63 in Headquarters and 81 in the ten regional offices.

PUBLIC ASSISTANCE AUTOMATED SYSTEM (PAAS)

Question: During FY 82, the Public Assistance Automated System (PAAS) was brought on-line, resulting in a reduction in regional paperwork. Please explain how this system operates. How much were you able to reduce regional paperwork requirements in FY 81 as a result of this new system? What is your estimate for FY 83 and FY 84?

Answer: The Public Assistance Automated System is simply an automated information system for public assistance grants. Since information is stored in the computer memory, it is not necessary to maintain voluminous files of forms, which average about 1,000 forms per disaster. The saving in paperwork varies in direct proportion to the number and size of disasters declared in each fiscal year.

FLOOD STUDIES

Question: According to your justification, you intend to initiate the required flood insurance studies at a rate of about 1,140 studies per year in each fiscal year from 1985 to 1987.

How does this relate to the FY 1982 and FY 1983 rate?
What accounts for your optimistic estimates?

You estimated the average cost per study in 1981 as $59,000. The actual cost per study in 1981 was over $77,000. Last year, you estimated the average cost per study in 1982 would be $79,000 and $88,000 in 1983.

What was the actual average cost per study in 1982?
How accurate is the $88,000 cost estimate for 1983?
What is the estimated cost per study for 1984?
If the cost estimates per study in FY 1983 and/or FY 1984 increase significantly, will you request a reprogramming or supplemental, or will you simply reduce the number of studies conducted?

Answer: The FY 1983 study initiations were based upon the actual dollar appropriations for those years. FY 1984 estimates are also based upon the funding request.

Based upon our estimates of the number of unstudied communities which would benefit from a detailed analysis of their flood hazards, approximately 4,090 studies remain to be initiated of the total of over 7,000 communities which are in the emergency program. The FY 1985-FY 1987 estimates of study initiations are based upon the number of studies needed to complete this initial study effort.

When discussing average costs per study from the viewpoint of the questions, it appears necessary to distinguish between an initial study and a restudy. For example, our FY 1983 budget request indicated an expenditure of $3.0M for 59 new (initial) studies in FY 1981 which averages to about $50K per new study. Restudies, with a higher average cost, would bring the total average cost of studies up to the figure you cite.

In FY 1982, we initiated 56 new studies at an average cost of $53,163 and 31 restudies at an average cost of $104,209. The total average cost per study of new and restudies combined is $71,351 in FY 1982.

The $88,000 cost per study estimate for FY 1983 looks very good. Currently, we estimate the initiation of 150 new studies at an average cost of 75,086 per study and 67 restudies at an average cost of $120,492. The combined average cost per study is $89,105.

In FY 1984, we are estimating an initiation of 607 new studies at an average cost of $40,038 and 39 restudies at an average cost of $100,000 per study. The combined average cost per study would be $43,657. We note here that in comparing the average FY 1984 costs for new studies with FY 1983 costs, the FY 1983 average cost per study was forced higher by the initiation of new studies in a few large metropolitan areas. In FY 1984, we do not expect to initiate any studies of that size, but rather, expect that all study initiations will be in rural communities.

We do not expect any significant increase in cost estimates for FY 1983. If FY 1984 estimates increase significantly, we would request a supplemental funding. The number of studies initiated would be reduced if supplemental funding is not approved.

FLOOD STUDIES

Question: Detailed flood studies are performed by private architectural and engineering firms as well as other Federal agencies like the Army Corps of Engineers and the Tennessee Valley Authority.

How much do you estimate will be paid to these firms and agencies in FY 1983--What are your projections for FY 1984?

Answer: For FY 1983 study initiations, we currently estimate $10,396,000 will be paid to the A&E firms and $9,070,000 to the Federal agencies.

It is difficult to project payments to firms and agencies for FY 1984 initiations since the communities to be studied and the selection of the study contractors in FY 984 will not begin until the fiscal year has started. The procurement process is designed to select contractors best able to develop the data needed at the lowest possible cost. The private A&E firms have historically been awarded more than 50% of the funds expended as the FY 1983 figures show.

FLOOD STUDIES

Question: During FY 1983 you requested $1.1 million to initiate ten new special flood studies.

What is the current status of each of these studies?

Answer: A total of $974,000 is being allocated for 9 special studies in FY 1983. Below is a brief description and the current status of each of the studies. Individual target dollars have not been provided for each of these studies since procurement actions have not been completed.

1983 Special Studies

- Development of installation standards and guidance manual for the placement of mobile homes in flood plains.

With the increase in demand for mobile homes as an alternative to conventional housing, there will be a continued demand to place mobile homes in flood-prone areas. Therefore, we need to develop specific design standards for mobile home foundations in flood hazard areas, as well as develop a guidance manual for methods of installing mobile homes which meet these foundation standards. Status: In procurement.

- Conference to initiate discussion on development of National Consensus on Flood-Resistant Design Standards. Status: In planning.

- Summary Report: Legal Issues In Comprehensive Natural Hazards Management

This report will be a followup to a previously funded FEMA contract with the American Bar Association, Institute For Lawyers on Floodplains and Wetlands. It will summarize issues and responses raised during the Institute, as well as address the critical questions about what the emergency manager needs to know about the legal issues in natural hazards management. Status: In procurement.

- Association of State Floodplain Managers - A grant to support the Association in special projects and FEMA flood hazard management activities. Status: In procurement.

- Flood Hazard Management Conference for States - Annual FEMA conference for state coordinators. Status: In planning.

- CAPEs/COE - Involvement by the Corps of Engineers in CAPEs and other floodplain management assistance to communities in the NFIP. Status: Pilot phase for $30,000 in progress.

- Non Personal Services Contract (Nick Lally)

This contract involves a purchase order agreement with Mr. Lally to provide expert opinions and evaluations on specified floodplain management problems, regulations and research studies. Contractural arrangement will follow those used in FY 1982 under a similar purchase order agreement. Status: In procurement.

- Develop flood damage data system to provide information on experienced flood losses on annual basis. Data will be used for program planning and evaluation by FEMA and other Federal agencies. Status: In planning.

- Prioritization and identification of communities requiring detailed flood insurance studies. Status: In procurement.

APPEALS OF FLOOD MAPS

Question: Flood Hazard Boundary Maps and Flood Insurance Rate Maps are subject to appeal by local officials and citizens. Last year, you indicated that during FY 83 you will be evaluating 400 official appeals?

Senator Garn—Continued

What is your current estimate for FY 83?

How many appeals do you anticipate in FY 84 and how much have you budgeted for appeals?

Answer: As of March 3, 1983, FEMA has received and is evaluating 320 official appeals. Based on current estimates, FEMA anticipates receiving approximately 100 additional appeals during the remainder of the fiscal year for a total of 420.

- In FY 1984, FEMA anticipates evaluating approximately 277 official appeals.
- This number may be low based on current activity.
- In FY 1984, FEMA has requested $2,590,000 for resolution of these appeals and the required map revisions.

FLOODPLAIN MANAGEMENT

Question: At last year's hearing you indicated that 120 communities did not comply with floodplain management ordinances in FY 1982.

How many did not comply in FY 1982?

What are you estimates of noncompliance for FY 1983 and FY 1984?

Answer: In FY 1982, 97 communities did not comply with the minimum standard for acceptable floodplain management ordinances under the NFIP.

In FY 1983 and FY 1984, we estimate that each year between 100 and 120 communities will not comply with the minimum standards for acceptable floodplain management ordinances under the NFIP.

FLOOD INSURANCE - AGENTS' COMMISSIONS AND TAXES

Question: Last year, you estimated $38,746,000 for agents' commissions and taxes in 1983. In FY 84, you are estimated $66,380,000 or a 71% increase. Why is this increase necessary?

Answer: In FEMA's FY 1983 budget justification, there was over $10,000,000 in deferred commissions included in "capital investment funded", a category eliminated in the present justification format. The other half of the difference is accounted for by the increased premium income projected in the current submission. This increase results from the full effect of rate changes inplemented last year, plus increased coverage purchased by policyholders.

NATIONAL RIOT AND CRIME INSURANCE PROGRAMS

Question: This year you are not requesting appropriations for either the Riot Reinsurance Program or the Federal Crime Insurance Program. The Administration is recommending that both programs be allowed to terminate at the end of Fiscal Year 1983. This is the same proposal as last year. The Riot Reinsurance and the Federal Crime Insurance programs are both operating at a deficit. This requires the National Insurance Development Fund to borrow to meet its obligations. If the two programs are terminated, what appropriations will be required to settle outstanding claims. What would be required to pay administrative and operating expenses while the programs are being wound down? What would be required to pay back Treasury borrowings and interest expenses? If the programs were to be continued at the FY 83 level, what appropriations, if any, would be required in FY 84?

Answer: If both of the programs are allowed to expire at the end of FY 1983, $19 million would be required to settle anticipated claims beyond FY 1983. If both programs are allowed to expire at the end of FY 1983, approximately $0.5 million in administrative costs and $3.6 million in operating expenses would be required to wind down the programs. Over $9.8 million in interest expense would be required to wind down these programs. FEMA would request an appropriation of $120 million to repay all Treasury borrowings. Our budget projections assumed that these programs would be continued beyond FY 1983, and FEMA has not requested an appropriation for FY 1984. We estimate borrowings in FY 1984 to be $18,862,000.

PHASE-OUT/RIOT REINSURANCE PROGRAM

Question: At last year's hearing, you indicated that in FY 84 you would request an appropriation to eliminate all debts incurred as a result of terminating the Riot Reinsurance Program. You estimate the amount to be $90-$100 million. How does this compare to your current request for FY 84?

Answer: The appropriation request referred to last year was to repay borrowings from the National Insurance Development Fund and anticipated that both the Crime Insurance and Riot Reinsurance Program would be terminated as of September 30, 1982. If these programs are allowed to expire at the end of FY 1983, an appropriation will be requested to repay all Treasury borrowings for FY 1985.

CRIME INSURANCE INVESTIGATIONS

Question: The staff of the Federal Insurance Administration is working with FEMA's Office of the Inspector General to investigate cases of possible fraud involving adjusters, agents and policyholders. What have these investigations revealed? In cases where fraud has been discovered, what action has been taken to prosecute these individuals? How long do you estimate it will take to complete these investgations? How many staff within the FIA are assigned to these investigations?

Answer: These investigations have revealed possible fraud and program abuse in connection with claims filed by policyholders and adjusters. Agents, in some instances, are also involved in these situations. During FY 82 and the first half of FY 83, 19,926 crime insurance claims have been closed (paid or denied). There were 6,078 claims denied for various reasons. Of the 6,078 claims denied, 258 were referred to the OIG because of suspected fraud. This amounts to 1.29% of the total number of claims closed during that 18 month period of time that were suspected of being fraudulent.

In cases where fraud has been discovered, they have been referred to United States Attorneys for prosecutive consideration. As of March 31, 1983, the OIG had 57 pending crime insurance investigations. It should be noted that a "case" may involve several individuals or claims. These include cases: a) under active investigation; b) waiting the initiation of investigation; c) referred for prosecutive consideration; and d) referred for agency administrative action. Seven of these cases have been referred to United States Attorneys for criminal prosecution and four for civil action.

During FY 82 and the first six months of FY 83, criminal charges were filed against nineteen (19) individuals. Eighteen (18) individuals were convicted (including guilty pleas).

Included in the pending investigations and criminal charges mentioned is a matter of special significance involving a group of individuals in the New York City area that are responsible for submitting a considerable number of suspected fraudulent claims. There are 955 suspected fraudulent claims involved, totaling $8.8 million covering several years. Criminal charges have been filed against fourteen (14) individuals thus far, involving approximately $1 million in claims, and all have been convicted (including guilty pleas). This investigation is continuing and is being conducted by FEMA's Office of Inspector General and the FBI.

CRIME INSURANCE INVESTIGATIONS

It is difficult to estimate the length of these investigations becuase they are often investigated jointly with other agencies such as the Federal Bureau of Investigation, Postal Inspection Service and others.

No staff are assigned on a permanent basis. The Inspector General has devoted one of its four investigators to work primarily on crime insurance matters. The Federal Insurance Administration staff does not participate in the active field investigation of these cases. However, the Federal Insurance Administration provides the support necessary for such an investigative program, including claims expertise, contractor liaison, computer analysis, and expert testimony during trials.

RIOT INSURANCE CLAIMS

Question: How many Riot Reinsurance claims are pending? Can you explain the nature of these claims and why they have not been settled? When do you expect to settle these claims?

Answer: There are two Riot Reinsurance claims pending. The Aetna Insurance Group presented a claim for a loss that occurred on or about March 28, 1978. There was an alledged riot at Vicennes University in Indiana. The reinsurance reserve for this claim is $1,500,000. We are awaiting the company presenting the claims investigation for our approval or rejection.

The second claim has been presented by the Insurance Company of North America. This involved a prison riot that occurred in New Mexico on February 2, 1980. A partial payment in the amount of $4,767,090 was made on February 24, 1982. We are awaiting the final claim to be presented by the insured before final settlement is made.

INDUSTRIAL EVALUATION BOARD

Question: You are requesting $2,400,000 for the resources preparedness element in 1984. This is an increase of $58,000 above the 1983 level. On page SE-52, under other resources, you mention reestablishing the Industry Evaluation Board. What will the Industry Evaluation Board do once it is reestablished? What resources in 1984 will be devoted to this effort? What are your cost projections for the Board during FY 85 and FY 86? How will the activities of this Board relate to the issue of worker protection under civil defense?

Answer: The Industry Evaluation Board is an interagency group which guides and reviews Department of Commerce activities related to analyses of industrial capability to produce specific products or product groups. The Board determines those items, materials or processes that are critical to industrial mobilization and directs studies to be made at the micro level. Upon completion of staff work, the Board reviews and approves the evaluation which then becomes a significant element of our industrial data base. Of 325 active Industrial Evaluation Board studies, only 20 have been completed in the last 5 years which seriously degrades the data base.

In 1984, approximately one quarter Full Time Equivalent will be devoted to the Industry Evaluation Board effort within the Federal Emergency Management Agency.

The Federal Emergency Management Agency effort will continue at the FY 84 level through FY 85 and FY 86. Total cost of the studies shared by several agencies will be approximately $100,000 per year.

The activities of the Industry Evaluation Board are unrelated to the issue of worker protection under civil defense.

ECONOMIC STABILIZATION

Question: During FY 83, the Resource Preparedness staff intends to evaluate the economic stabilization readiness of three additional Federal agencies. What specific FEMA recommendations have been adopted by other agencies so that they can improve their economic readiness?

Answer: We recommended that the Federal Reserve and the Treasury Department form an interagency task force to evaluate proposals for:

- emergency utilization of the gold stock
- the emergency currency stockpile

The Federal Emergency Management Agency staff members recommended that the Department of Labor establish an executive reserve for dealing with an emergency wage and salary stabilization effort. The Department of Labor has not yet decided.

The Federal Emergency Management Agency and the Treasury Department staff members have both recommended the construction of an additional printing and engraving facility in a less vulnerable location somewhere in the West. Treasury has not yet made a decision.

RESOURCE PREPAREDNESS PROGRAM INTEGRATION

Question: You are requesting $160,000 for a new element in 1984 -- Resources Preparedness Program Integration. What is the purpose of this program? What specific goal and objectives have you established for FY 84? Why can't these activities be conducted as an ongoing function within your other planning programs?

Answer: This is explicit identification of the Resources Preparedness Office management staff which was previously arbitrarily allocated one Full Time Equivalent to each of the four subelements and includes the office director, one professional, and two clericals.

The program funds involved were previously carried in the Resources Assessment element (note the decrease under this element). These funds have been realigned so that activities crossing the Resources Preparedness elements can be seen separately. Funding involves computer time sharing and models used by the four elements.

SECURITY PLANNING

You are requesting $275,000 for Security Planning in 1984. You state that substantial increases will be required to fully implement a National Civil Security Program.

Question: How much of an increase do you envision in future years?

Answer: The Security Planning program element within FEMA provides a national network for enhancing the integrity of major resource systems including facilities, personnel, and information from deliberate acts of violence such as terrorism, sabotage and civil disturbances. This network is vital in view of the current trend toward increasing major disruptive acts of violence and the presence of critical vulnerabilities in our technologically complex resource systems.

The responsibility for Security Planning has been a function of FEMA and its predecessor agencies since the early 1950's. This function was virtually dormant, however, for many years. This dormancy has been reflected in numerous GAO reports which state the overall Federal emergency preparedness to cope with terrorism and sabotage is incoherent and inadequate. We are not prepared to respond to major deliberate disruptive acts of violence. In carrying out the actions cited above, the "costs" (i.e., economic, societal, environmental, etc.) of ensuring the security of major resource systems will be identified.

Corrective actions to ensure a Federal program coordinated with State government and the private sector will require approximately $2M/year in future FEMA budgets.

Question: What are the specific elements of this program that will remain to be funded in the outyears?

Answer: The following actions must be done for each resource system (transportation, energy, telecommunications, food, water, waste disposal, industry, etc.):

- identify strategically important potential targets of deliberate attack;
- coordinate the production of vulnerability analysis and consequence estimates based on known threats;
- ascertain options for preventive action;
- review emergency preparedness planning efforts of other Federal departments and agencies;

- and prepare periodic appraisals of the Government's civil security readiness posture.

Question: How much are you requesting for this program in your salaries and expenses account for FY 84 -- both in dollars and positions? How does this relate to the FY 83 levels?

Answer:	FY 83	FY 84
Dollars	$225K	$775K
FTE	5	18

STAFFING FOR THE EMERGENCY MANAGEMENT INSTITUTE AND NATIONAL EMERGENCY TRAINING CENTER

Question: The justification indicates the Emergency Management Institute (EMI) used 38 staff years in 1982, is allocated 53 in 1983, and requests 55 in 1984. The National Emergency Training Center (NETC) used 28 staff years in 1982, is allocated 13 staff years in 1983, and requests 13 staff years in 1984. Why is staffing for the EMI increasing and staffing for the NETC decreasing?

Answer: In preparing the 1983 Congressional Budget Submission an attempt was made to identify all Civil Defense staff resources within FEMA. In the case of the NETC and the EMI, the positions were prorated and assigned to the dual training functions to be accomplished.

When the 1984 Congressional Budget Submission was prepared, the newly created activities had a year of actual experience. The change in the staffing levels for the EMI and the NETC between 1982 and 1983 represents a one-time shift of 15 staff years to reflect this experience. The total number of staff years for both 1982 and 1983 remained constant at 66.

An increase of 2 staff years has been included for the EMI in 1984 to meet the program requirements.

NATIONAL DEFENSE EXECUTIVE RESERVE

Question: Your justification indicates eight staff years will be devoted to the National Defense Executive Reserve (NDER) in 1984. Explain the purpose of NDER?

Answer: The National Defense Executive Reserve (NDER) is a standby government-wide program of business executives and other civilians who would be willing to serve in an expanded Federal Government which might be necessitated by a manmade, natural or national security emergency.

Question: How many staff years are being devoted to the NDER program in 1983?

Answer: There are 3 staff years and one permanent part-time employee, 16 hours per week, devoted to the National Defense Executive Reserve (NDER) program in 1983.

Question: What is the total amount of resources FEMA is requesting for this program in 1984?

Answer: The Federal Emergency Management Agency (FEMA) is requesting $35,000 in program funds and $320,000 in salaries and expenses for the NDER program in FY 1984.

Question: How much is in the 1983 budget for NDER activities?

Answer: There is $35,000 in the 1983 budget for National Defense Executive Reserve (NDER) activities.

Question: How many people will be in the NDER in 1984?

Answer: Approximately 1,700 active members in the ten Federal departments and agencies sponsoring NDER units.

Question: What do you mean "begin a full training program to support individuals volunteering for the program"?

Answer: To have an agency orientation, position related training, advanced training, on-the-job training, and exercise participation experience.

Prior training allows for immediate capability to perform assigned duties in the event of activation.

Until now an acceptable training program has not been in place.

FIRE PREVENTION & CONTROL

Question: What is your total request for FEMA's Fire Prevention and Control activities?

Answer: We are asking $14,720,000 which includes $4,185,000 for the U.S. Fire Administration, $7,624,000 for the National Fire Academy and $2,911,000 for the Emmitsburg training site maintenance.

Question: How does this relate to your 1983 level?

Answer: It is an increase of $1,388,000 to be used primarily for upgrading the Emmitsburg facility to improve the life-safety provisions on the campus.

Question: What is the Commerce Department's request for fire research at the NBS and how does this compare to the FY 83 level?

Answer: The Commerce Department has zero funded the fire research activity at the National Bureau of Standards. I am informed that their program last year was funded at $5,886,000.

Question: What programs will be discontinued at NBS if the Congress approves the Commerce Department's budget?

Answer: The simple answer is that all of their fire research activity will be discontinued, other than that supported by other Federal agencies. Their current program provides for research in the following areas that would have to be terminated or curtailed:

- fire risk analysis, to develop means to measure and manage fire risk to people, property and systems to help home builders select the best fire protection technology;
- facility fire safety, to develop engineering models for use in predicting how facilities perform in a fire situation;
- suppression and extinguishment, to establish means to evaluate effectiveness of materials and systems in a fire environment such as smoke detectors and sprinkler systems;
- smoke and toxic gases, to understand the properties, spread of smoke, and toxic gases from fires in order to have a basis for control of them;
- fire growth process, to develop mathematical models of fire growth that predict growth and extinguishment of fires; modeling is cheaper than full scale burns and provides for greater testing flexibility;
- fire properties of materials, to develop and validate measurement techniques to determine how specific materials or combinations react in a fire situation;
- fire toxicology, to identify harmful combustion products and measure effects on living organisms; and
- fundamental research, to expand the basic knowledge and understanding of the phenomenom of fire.

GAO REPORT ON FEMA MANAGEMENT

Question: A key phase of FEMA's scheduled implementation of its Agency-wide management system was the integration of the Agency's program planning process with the FY 84 budget cycle. Has this occurred as planned in June 1982?

Answer: No, it was however, recently implemented and does include FY 83 and FY 84 data and is being integrated with the FY 85 budget cycle. Submission of the Agency's FY 85 budget will be based on the Agency-wide management system and the implementation of the Agency's program planning process.

Question: You conducted a major re-alignment in June 1981. What required that a second re-alignment take place 18 months later?

Answer: Some organizational adjustments were made to FEMA on January 7, 1983, to facilitate increased coordination and effectiveness. These adjustments have helped us to carry out several important missions more efficiently. Among those adjustments were:

- A new Emergency Operations unit was formed which consolidated activities related to Government Preparedness, communications, and response coordination.
- The Comptroller's function, including the essential budgeting function, was raised to the level of an independent office reporting to the Director of FEMA.
- The U.S. Fire Administration was combined with the Training and Education Directorate and now forms the Training and Fire Programs Directorate.

Question: Has the recent re-alignment affected the scheduled implementation of the Agency-wide management system or your efforts to improve administrative support functions like personnel, accounting, and procurement?

Answer: The present re-alignment did not affect the implementation of the Agency-wide management system. Similarly, the Office of Personnel was not affected. The realignment was instrumental in improving the administrative support functions of accounting and procurement. One major improvement was to raise the Comptroller's function, including the essential budgeting function, to the level of an independent office reporting to the Director of FEMA. Another improvement was to remove the Acquisition Management Division which had been in the Comptroller's Office and elevate the procurement responsibility to an Office level activity.

Question: GAO found that the evaluation function has been neglected since FEMA's creation. Since the GAO report, have there been any efforts to conduct a comprehensive, external, evaluation of major programs such as Civil Defense, Disaster Assistance and Floodplain Management.

Answer: Program evaluations are a planned follow-up activity which will become an integral part of the Agency-wide management system. In addition, within the resources available, special studies are being conducted by the Office of Program Analysis and Evaluation on an on-going basis. External evaluations of major programs are currently being conducted. The GAO is examining the Civil Defense Program and the FEMA Inspector General continues to do external audits of both the Disaster Assistance and Floodplain Management areas.

Question: What has been done to identify and gather programmatic information that would measure program acomplishments against Agency goal statements?

Answer: The Agency-wide management system has identifed program goals and defined outputs that can and will be measured to achieve those goals. The multi-year planning process quantifies both the outputs and the associated resource requirements by year for a seven year period. A follow-up process of tracking and reporting actual accomplishments to planned and budgeted work plans will become an integral part of the Agency-wide management system.

Question: Is your accounting system, now that it has been approved by GAO, providing FEMA managers with accurate, useful and timely information?

Answer: Prior to answering the question, we must provide clarifying information on GAO's approval of the Agency's accounting system. The accounting system was submitted to GAO for approval in December, 1982. The accounting system's documentation was found acceptable by GAO in April, 1983. The accounting system will be tested by GAO in the future. A date has not been established for the test.

Monthly reports are forwarded to Agency managers. These reports contain the following information:

- Comparison of budgeted amounts against the actual amounts expended and obligated by object class, program office, and organizational element.
- Detailed listing of all obligations made and payments against the obligation.

Question: The system design, as described in the GAO report, would allow accounting data to be related to both the FEMA program structure and the appropriation accounts to allow more meaningful analyses of actual and budgeted expenditures. Do you now have that capability?

Answer: The accounting system has been codified so that data can be related to both the FEMA program structure and appropriation accounts.

FY 83 PAY SUPPLEMENTAL

Question: You are asking for $1,645,000 for the FY 83 pay raise supplemental.

What was your request to OMB?

What percent of the pay cost will you have to absorb?

Answers: The First Concurrent Budget Resolution for Fiscal Year 1983 assumed a 50% absorption by the Agencies. OMB Bulletin No. 83-7, Increased Pay Costs for Fiscal Year 1983, required that at least 50% of the October 1982 pay raise and related costs, including (100%) employers' portion of the Medicare Hospital Insurance payment of the 1.3% be absorbed by agencies. Therefore, the following was submitted:

	1983 Requirement	Absorbed	%	Request
General pay raise	$2,900,000	$1,450,000	50	$1,450,000
Executive pay raise	390,000	195,000	50	195,000
Medicare	675,000	675,000	100	...
Total	$3,965,000	$2,320,000		$1,645,000

MERIT PAY INCREASES

Question: How much money have you included in your FY 84 budget request in order to provide employees with merit pay as specified in the Civil Service Reform Act?

Answer: $612,000 is requested in 1984 for merit pay.

SES BONUSES

Question: How much have you included in your budget for SES bonuses during FY 84?

Answer: $70,000 is request in 1984 for SES bonuses.

ALLOCATION OF PERSONNEL RESOURCES

Question: The number of permanent positions in 1983 for the Salaries and Expenses Appropriation decreases from 2,406 requested last year to the current 1983 estimate of 2,312. This results from the Congress not appropriating the entire amount requested for the Salaries and Expenses Appropriation in 1983. Of the increase in permanent positions requested for 1983, about 25% were for headquarters and 75% were for the regions.

The table on Page SE-3 of your justification, however, shows that you actually have allocated your positions in such a manner that you now have two positions less than requested in headquarters.

Why have you put nearly 100% of the 1983 position increase in headquarters?

Answer:

	1982 Authorized	1983 Request	Inc. Req.	Cong. Reduc.	Net Inc	Cong. Directed Restoration of USFA	1983 Current Estimate
Hdq.	1,511	1,565	+54	-22	+32	+20	1,563
Reg.	692	841	+149	-92	+57	...	749
Tot	2,203 1/	2,406	+203	-114	+89	+20	2,312

1/ Includes 50 positions for FIA

Senator Garn—Continued

We have two positions less than requested in Headquarters due principally to the Congressionally directed restoration of positions for Fire Prevention and Control. Speaking specifically to the application of 89 new positions allowed by the Congress, we have applied 32 of those to Headquarters (36%) and 57 to the Regions (64%). This breaks down as follows:

	Hdq.	Reg.	Total
Civil Defense	4	...	4
Gov't. Preparedness	28	57	85
Total, New Positions	32	57	89

ALLOCATION OF PERSONNEL RESOURCES

Question: The Civil Defense portion of the 1984 Salaries and Expenses Appropriation request is $33,375,000. This is $5,611,000 above the 1983 program. Workyears for 1984 are estimated at 745, an increase of 84 above the 1983 level.

How will these 84 workyears be distributed between Headquarters and the regions?

How do you account for this emphasis on Headquarters staffing -- what will they be used for?

Answer: The 84 workyear increase for Civil Defense will be applied on a 29% (24 WY) Headquarters 71% (60 WY) Regional basis. The 24 Headquarters positions will be applied as follows:

	Area	Number
Research -	to plan and manage, executive research and development programs and projects	+1
Telecommunications	to plan and manage the telecommunications systems to include expansion of the Washington Warning System	+1
	to operate the communications center portion of the Emergency Information and Coordination Center 24 hours per day, 7 days per week	+10
		11

Training and Education	to monitor the contracts and perform in-house development of training and education on civil defense projects	+3
State and Local Assistance	for program and management support of the full range of civil defense programs at the State and local levels, i.e., State and Local Emergency Management, Radiological Defense, Population Protection, and State and Local Direction, Control and Warning	+9
Total		+24

SALARIES AND EXPENSES - OTHER THAN PERMANENT POSITIONS

Question: Personnel costs for other than permanent positions increases from $1,610,000 requested last year for 1983 to the current 1983 estimate of $2,800,000 to $3,752,000 estimated for 1984. Most of this increase is in the program support activity.

Why is the 1984 "other than permanent" object classification estimate more than double last year's 1983 estimate?

Answer: An explanation of the increases follows:

1983 Request	1983 Current Estimate	Diff.
$1,610,000	$2,800,000	$1,190,000

1983 Current Estimate	1984 Request	Diff.
$2,800,000	$3,752,000	$952,000

1982 to 1983

• $690,000	50 Shelter Survey Student staff-years at $14,000
• 500,000	better accounting records
1,190,000	

1983 to 1984

• 952,000	74 other than permanent intermittent employees to augment the full-time permanent positions requested.

Senator Garn—Continued

STANDARD LEVEL USER CHARGES

Question: Your FY 83 Budget contains $6,013,000 for Standard Level User Charges. This represents a 2.4% increase over the FY 82 level. ($5,872,000) One reason for the FY 83 increase was GSA's proposed increase lease charge for space. As you know, Section 108 of the Continuing Resolution (P.L. 97-377) provided that no agency shall pay GSA a higher rate per square foot than the FY 82 rate.

In calculating your FY 83 request for these user charges, how much was included for the expected GSA increase?

Are these funds, which are now in excess of your actual requirements, being used for other purposes -- or will they be used to offset your requirements for an FY 83 pay supplemental?

Answer: The increase of $141,000 over the 1982 level is due to our having to pay GSA for a full year for space occupied at 500 C St., SW

For 1983, GSA was asking us to pay $6,428,000 for the 559,312 square feet of space we rent from them nationwide. This is $415,000 more than the $6,013,000 we had available in our base. As part of our 1984 submission to OMB we were seeking approval to request a supplemental to fund the $415,000 difference. During that period Congress passed the Continuing Resolution (PL 97-377) providing no Agency pay a higher rate per square foot then the 1982 rate.

Our 1983 budget to the Congress was $6,013,000 and did not include any amounts for GSA rate increases. Therefore, we had no excess funds available for SLUC. If we had had excess funds available they would have been applied to offset the costs of the General Schedule and Executive pay raises which were effective in 1982.

We are asking for the $415,000 as a budget increase for 1984 (6.9% more than the $6,013,000 base). We are also seeking $201,000 for 134 of the 296 new positions being requested in this budget. Therefore, if we take the $6,013,000 we have in the base, add to it the $415,000 GSA originally wanted us to pay, and the $201,000 we need for new positions, you arrive at the $6,629,000 figure shown for SLUC in the Appendix to the President's Budget.

QUESTIONS SUBMITTED BY SENATOR HUDDLESTON

EARTHQUAKE HAZARDS REDUCTION

Question: What level of funding is proposed for each State in the Central United States Earthquake Preparedness Project (CUSEPP) in fiscal year 1984?

Answer: In FY 1984 CUSEPP will concentrate on the seven States (Missouri, Arkansas, Tennessee, Illinois, Indiana, Mississippi, and Kentucky) in the highest Mercalli Intensity zones (IX and above) as determined from a USGS analysis of the seismicity of the Central U.S. area. Direct funding is expected to be in the range of $13 - 14,000 per State, for purposes of initiating planning efforts and continuing support of the seismic safety panels. The bulk of the FY 1984 CUSEPP budget will be used to: begin data collection and vulnerability analysis for the rest of the seven State area which is essential prior to development of contingency plans by the States; continue scientific studies for identifying ground shaking and liquefaction hazards; study the economic impacts and to begin mitigation strategies; and develop and implement public education and awareness programs. This funding will benefit all seven States and it is not meaningful to segregate it by State.

Question: How will funds for earthquake studies and programs to be performed by the states be managed in the comprehensive cooperative agreements with the states?

Answer: The funds for earthquake studies and programs will be managed the same under the comprehensive cooperative agreements as under any other grant or contract funding vehicle.

Question: What is the status of the CUSEPP in regards to the Integrated Emergency Management System?

Answer: FEMA's Integrated Emergency Management System (IEMS) is still in the formative stage. However, earthquake plans and preparedness is considered an integral part of FEMA's integrated emergency management system. As FEMA proceeds to implement IEMS, guidance will be provided to the regions, State and locals for incorporating the activities of the Central U.S. Earthquake Planning Project into their IEMS effort.

EARTHQUAKE HAZARDS AND PUBLIC AWARENESS

Question: Much emphasis has been placed on the public awareness of the earthquake threat. What efforts are underway or planned for public information and public education?

Answer: FEMA has initiated the development of a comprehensive Earthquake Education Program designed to increase various audiences' understanding of the earthquake phenomena and attendant risks, and promote positive preparedness and mitigation actions.

The Earthquake Education Program focuses on four major activities:

1. The Development or Modification of Quality Educational Materials

In FY 1983, the best of existing products are being compiled and modified to enhance their applicability in various geographic areas. During FY 1984, additional products will be developed to satisfy special educational needs.

2. The Establishment of Community Outreach Programs

Pilot projects initiated in FY 1983 are described below. The U.S. Geological Survey and the National Science Foundation are participating in these pilot projects by supplying publications and films and by assisting in developing tracking mechanisms for continuous project evaluation.

Earthquake Education Centers

FEMA is providing funds for the establishment of Earthquake Education Centers (EECs), housed in existing institutions in the Central and Southeastern U.S. The Centers and future - funded EECs will not only serve to respond to public inquires, but also actively promote individual and community earthquake preparedness.

EEC activities include recruiting and training community outreach volunteers; maintaining a library of educational materials; establishing a speakers' bureau; and tracking dissemination and use of products and services.

Earthquake Education and Safety Program for Schools

In FY 1983, FEMA is funding a pilot earthquake education and safety program for schools which will be developed and tested in Seattle, Washington. The education component includes an earthquake curriculum package designed and developed by the Environmental Volunteers of northern California, a training workshop for volunteers and professional teachers, and a comprehensive kit of teaching aids. The earthquake safety component emphasizes earthquake drills and provides guidance for involving administrators, teachers, parents, and students in developing response and short-term shelter plans.

3. The Design and Presentation of Special-Topic Courses

In FY 1982, FEMA provided funds for the first in a series of special-topic courses on hazard mitigation. This course, entitled "Earthquake Hazard Mitigation for Utility Lifelines" is intended to provide city and county public works directors and engineers with information on how to: (a) assess the potential impact of ground shaking on utility systems, (b) lessen the effects of ground shaking on critical components of these systems, and (c) develop procedures to hasten system recovery following an earthquake. This course was field tested in the San Francisco Bay area in April 1983.

4. The Transfer of Research Information

FEMA and the U.S. Geological Survey (USGS) will continue to co-sponsor workshops designed to increase the hazard awareness of elected officials and policy influentials in the private sector. Workshops are scheduled for Charleston, SC, Boston, MA, Little Rock, AR and the U.S. Virgin Islands.

Further activities include continued co-support (with the National Science Foundation and other Federal agencies) of the Natural Hazards Research and Applications Information Center (Boulder, Colorado). This center serves as a clearinghouse for hazard-related studies, publishes a newsletter, and provides workshops to facilitate a continuing dialogue between researchers and practitioners.

Demand for Increased Readiness

In areas where awareness is already high (as it is in California because of the frequency of earthquakes) response planning has been underway for a number of years. In the central and eastern United States where earthquake recurrence periods are long, a concerted awareness and public education effort is required as a foundation for a successful readiness effort which FEMA has planned for FY 1984 and future years.

EARTHQUAKE EDUCATION CENTERS

Question: FEMA has proposed establishment of Earthquake Education Centers. Would needs in this area be better served by managing this effort through existing organizations or state emergency agency education programs?

Answer: FEMA intends to establish Earthquake Education Centers (EECs) in existing institutions rather than create new ones. The first EEC proposed for the Central U.S. will be housed in the Tennessee Earthquake Information Center. This center was established by the Tennessee State Legislature in 1977.

FEMA's funding for an EEC will enable the Tennessee Earthquake Information Center to take a more active role in enhancing various audiences' understanding of the earthquake risk, their awareness of hazards to life and property, and their capability to put into practice measures to reduce personal and community vulnerability.

The Tennessee EEC is a prototype effort and will serve as a model for community outreach programs in other high-risk States. Because of its status as a research and development project, FEMA's offices of the Comptroller, Acquisition Management, and Research and Development recommend direct Federal funding during the initial project years. Given continued State interest in this project, funds in FY 86 and beyond will be channeled through the State.

Future-funded non-prototypical EECs will include academic institutions, science centers, state geological surveys, state emergency services agencies, or other institutions which are highly visible to the public and possess the facilities and capability to address the earthquake information and education needs of individuals and groups within the public and private sectors. Funds for establishing these EECs in FY 84 and beyond will be awarded to the States. These centers will become an integral part of the total ongoing State effort in earthquake hazards reduction.

The concept and function of an EEC originated from the recommendations of the Working Group on Earthquake Hazards Reduction (Office of Science and Technology Policy), and were included in their report, "Earthquake Hazards Reduction: Issues for an Implementation Plan." Over the years, the need for an EEC and the importance of focusing such a center in an existing institution with high public visibility has been reinforced by subsequent hazard conferences and working groups.

Priority Attention - Earthquakes

Question: There is concern in the Congress that FEMA is not giving priority attention to earthquake activities and that there is a shortage of staffing with diverse expertise needed in geology, response and recovery assistance, hazard mitigation, law, engineering, planning, economics and other fields.

Please provide for the Committee a report on current staffing situation and staffing needs to carry out the extensive earthquake-related responsibility on the national and regional levels.

Answer: Currently FEMA has 12 full time professionals supporting the earthquake program; 4 in Headquarters and 8 in FEMA Regional Offices.

Staff currently working in earthquake program activities have a broad spectrum of professional experience with expertise in the areas of planning, response and recovery, hazard mitigation, engineering, and law. As of July 1, 1983, a seismologist will join the FEMA staff on a time share with the U.S. Geological Survey. Also to increase our technical capabilities, FEMA is investigating obtaining the services of an earthquake engineer.

Earthquake Vulnerability Studies

Question: FEMA has conducted earthquake vulnerability studies in six cities in the New Madrid Region. What results have come from these studies?

Answer: In FY 1982 FEMA Regional Staff conducted a structure and key facility inventory in six cities in the New Madrid seismic region (Poplar Bluff, MO, Carbondale, IL, Evansville, IN, Paducah, KY, Memphis, TN, and Little Rock, AR). A contractor is in the final stages of analyzing the results from applying damage-ratio curves to this inventory, in order to produce estimates of structural damage and loss of life in the event of a catastrophic earthquake in the region. This effort is scheduled to be completed by the end of FY 1983.

EARTHQUAKE HAZARDS REDUCTION

Question: What actual influence or control does FEMA have in regard to earthquake projects funded by either the National Science Foundation or the U.S. Geological Survey?

Answer: As the designated lead agency for the National Earthquake Hazards Reduction Program, FEMA works closely with both the National Science Foundation (NSF) and the U.S. Geological Survey (USGS) to develop projects which support the goals of the National Earthquake Program. Also, FEMA is represented on the project selection boards of both these agencies. As lead agency, FEMA has established a formal policy review group comprised of FEMA, USGS, NSF, and the National Bureau of Standards, (NBS), which, along with the Interagency Coordination Committee (made up of representatives from the above mentioned agencies as well as Housing and Urban Development, Department of Transportation and Veterans Administration) establishes the objectives and direction of earthquake activities within the four agencies.

Furthermore, informal mechanisms, including close working relationships between the professional staffs of the agencies, contribute further to FEMA's influence within the Federal community regarding earthquake activities.

FIA - ADMINISTRATIVE AND MAPPING COSTS

Question: Appropriated funds cover the administrative costs of FIA and of preparing flood insurance rate maps. Had these funds not been appropriated in FY 83, how much money would have to have been raised through rate increase to cover these costs? What is the situation with respect to FY 84?

Answer: In order to fund the administrative expenses of FIA through the National Flood Insurance Fund, no increase in rates would have been required in FY 1983 nor any in FY 1984. The expense constant of $20 per policy is sufficient to cover administrative expenses as well as operating costs. If the cost of rate maps was factored into the flood insurance rates, each policy would increase by $20-25.

DEFICITS BY RISK ZONE

Question: Apparently all of the so-called "risk zones" have operated at a deficit. Can you explain why this has happened on a zone-by-zone basis? Are the deficits greater in some zones than others?

Senator Huddleston—Continued

Answer: The answers as to why each risk zone has operated at a deficit are basically the same although some risk zones have proven to be larger problems than others. Basically, when the flood insurance rates were developed in the early years of the Program, the government and industry actuaries had to make projections based on hydrologic and actuarial models that were untested with any actual flood insurance premium and loss statistics. In retrospect, it appears that some of the assumptions that had to be made at that time were overly optimistic. It was not until 1979 that any detailed data suitable for analystical purposes on a risk zone basis were available. Sine that time there have been three major rate revisions that reflect Program experience and further development of the hydrologic and actuarial models. Further development of actuarial models and informations systems is being conducted by FIA with the advice of a special industry actuarial/underwriting committee. There are zones where deficits were particularly unexpected, namely the B and C zones which represent areas outside of the 100-year flood plain. Studies have attributed this to an unexpectedly large urban drainage problem that is too expensive to map and adverse selection. Adverse selection occurs in areas where insurance is not mandatory, and it is purchased only by those who perceive a risk. Thus, the loss frequency is much higher in an area where adverse selection has occurred.

Question: A study done for FEMA in 1980 apparently indicated that seven percent of all flood insurance policies in force were accounting for nearly twenty-five percent of the dollar value of claims being paid. Which policies were these? Is this still the case?

Answer: The precise study referred to in this question is not identified, but we can respond generally. The following chart illustrates the communities with the greatest losses as of March 30, 1983:

Community	Losses Paid	Policies in Force
Jefferson Parish, LA	$78,450,476	59,199
New Orleans & Orleans Parish, LA	46,144.934	59,923
Galveston County, TX	37,773,595	10,006
Harris County, TX	37,573,100	34,595
Houston, TX	33,968,192	52,824
New York City, NY	31,413,513	16,757
Friendswood, TX	30,231,737	3,109
Total	$295,555,547	236,413
Nationwide	$1,192,405,545	1,859,847
% of Nationwide	24.8%	12.7%

The trend referred to in the question above has probably remained fairly constant if one were to look at individual policies within these communities. The percent of policies has increased above 7% as the awareness of flooding has increased and as a result of insurance being required after a declared flooding disaster.

SURPLUS IN THE FLOOD FUND IN FY 1982

Question: In FY 82, the program, for the first time, has a slight surplus. Do you expect this to be the case in FY 83 also? Did any zones show a surplus?

Answer: The slight surplus in the flood program in FY 1982 resulted from two factors: rate increases and less than average flooding. Given the losses for the first half of FY 1983, we do not anticipate a surplus, and indeed, our budget projections assume borrowing $84,612,000. Some of the zones did show a slight surplus in FY 1982.

TREASURY BORROWINGS

Question: What is the total amount which FIA has to date borrowed from the Treasury? How much do you expect to repay in FY 84? Do you anticipate that Congress will continue to appropriate funds to cover Treasury repayments?

Answer: Through September 30, 1982, the National Flood Insurance Fund has borrowed $973,884,000 from the Treasury of which $928,484,000 has been repaid through appropriation.

In FY 1984, we are requesting an appropriation of $37,521,000 to repay Treasury borrowings.

We hope that Congress will continue to approve our appropriations requests. This reduces the amount of interest the program must pay, and it gives the Congress a focal point for program expenditures.

DECLINE IN FLOOD INSURANCE POLICYHOLDERS

Question: The number of policies in effect has declined from a peak of more than 2 million in December 1980 to about 1.86 million in November 1982. Do you anticipate further declines or do you believe the decline has stopped. What can FIA do to promote greater coverage?

Answer: We have seen increases in the number of flood insurance policies over the last four months. As long as mortgage activity continues to increase, we expect the number of policyholders to increase. During the decline period, our renewal rate remained almost constant.

We include an automatic inflator in renewal notices. Policyholders can opt for this increased coverage or maintain the existing coverage. Even though policies declined for a time, we still saw a steady increase in the average amount of coverage purchased.

Senator Huddleston—Continued

FLOOD INSURANCE - RESTUDIES

Question: Your justification indicates that you are doing a number of flood insurance restudies. What necessitates a restudy?

Answer: Restudies are required for certain communities because it is necessary to:

- update existing flood risk and elevation data to account for the extensive physical changes in the watershed and flood plain (such as flood control projects, new bridges culverts, etc.) which have significant hydrologic or hydraulic effects on flood discharges and elevations;
- update previous study results to reflect new and improved study methods and advances in the state-of-the-art methodologies;
- extend detailed insurance risk and elevation data in Regular Program communities into areas previously studied by approximate methods which are now subject to development pressure and unstudied annexed areas;
- enhance and supplement existing data such as by adding floodways wave heights in coastal areas, and other risk information;
- correct errors which may be found in the original flood insurance study.

Restudies are only undertaken when the change to existing study data is too extensive to be handled via other means, such as map revisions and Letters of Map Amendment.

Flood Insurance

Question: As of November 1982, about 8,800 communities were still in the emergency program. How quickly can these be moved into the regular program?

Answer: FEMA plans to convert these communities to the regular program through execution of its four year plan to initiate flood studies for those communities requiring detailed studies, supplemented by the special conversion process for communities which do not require studies.

FEMA plans to initiate the remaining needed flood studies by the end of FY 87 using both existing data studies (approximately 1,100 from FY 84 thru FY 87) and the normal flood insurance study process (approximately 2,970 initiations from FY 84 thru FY 87). Also planned in this effort is the special conversion (conversion without detailed study) of approximately 1,500 communities from FY 84 thru FY 87. Communities which are studied under the normal process will need three to four years from initiation until the study and conversion go into effect. Thus, under execution of this plan, all communities will be converted to the regular program by the end of FY 92.

These estimates are based on a universe of approximately 4,070 communities still requiring detailed study. FEMA has initiated a contract to determine the exact number of communities which will require a detailed study. Based on the results of this study, and funding appropriations, FEMA will revise the plan as necessary.

Below is a table showing approximate cumulative regular program communities under the plan?

FY	with elevations	without elevations	Total in reg. prog.
83	7,776	2,462	10,238
84	8,276	3,063	11,339
85	8,595	3,693	12,288
86	9,088	4,321	13,409
87	9,538	4,951	14,489
88	10,088	4,951	15,039
89	10,830	4,951	15,781
90	11,530	4,951	16,481
91	12,230	4,951	17,181
92	12,911	4,951	17,862

CATASTROPHIC RESERVE

Question: FIA has no so-called "catastrophic reserve." What would a reasonable reserve be? What options have you considered for financing the creation of such a reserve?

Answer: The FIA has made calculations of catastrophe loss reserve requirements using the insurance industry simulation model approach developed during the flood insurance feasiblity studies in 1966. To establish a catastrophe reserve that meets theoretical requirements, the NFIP would have to raise over $1 billion. Obviously, this cannot be raised from current premium income. Further, there is no explicit statutory authority to establish, within the National Flood Insurance Fund (NFIF), a separate catastrophe loss reserve which would earn investment income that would supplement premium income to meet anticipated increasing exposure. The FIA has developed a new simulation model that will aid the NFIP in estimating the probable size of the unfunded catastrophe loss reserve. With this analytical tool, objective criteria would be developed to define both average annualized losses and the concurrent catastrophe loss reserve requirements. This was brought to the attention of the special insurance industry actuarial/underwriting committee in 1982 to obtain their technical advice for further development of the model. When this analysis is completed, specific proposals to address the establishment of the catastrophe loss reserve will be evaluated by FEMA.

Senator Huddleston—Continued

NUCLEAR ATTACK CIVIL PREPAREDNESS

Question: In FY 83 you requested $46.2 million for nuclear attack civil preparedness. Congress cut this by $27 million. In FY 84 you are requesting the equivalent of $38.3 million. Are any of the activities requested under the $46.2 million the same or basically the same as those cut by Congress in FY 83?

Answer: In FY 83, Congress reduced the overall civil defense funding request to $147.3 million and did not specifically indicate which programs were to be reduced. FEMA in meeting the directive of the President and the intent of Congress, allocated funding to specific programs to stay within the total appropriation of $147.3 million.

In keeping with the intent of Congress as expressed in recent amendments to the Federal Civil Defense Act, FEMA is in the process of implementing an Integrated Emergency Management System (IEMS) approach on programs authorized under the Act. IEMS is designed to build capabilities at the State and local level to save lives across the full spectrum of emergencies that may occur. This includes natural disasters; technological disasters such as release of hazardous materials or accidents involving radioactive materials (including nuclear power plants); resource shortages; and enemy attack. Thus, the plans to be developed using the IEMS approach are all-encompassing and include all disasters that a jurisdiction can be subjected to. They are not limited to plans dealing with only nuclear attack evacuation and in-place protection.

The potential impact of IEMS is more significant than merely modifying existing Crisis Relocation Plans to take into account all hazard scenarios. Where in the past, evacuation or in-place protection plans had been developed for such technological hazards as hurricanes, floods, fixed nuclear facilities, etc., we see those plans providing a base for modification to serve other hazard scenarios including nuclear attack. In future starts of evacuation or in-place population protection planning, we intend to implement various planning assistance activities in a more complementary fashion so as to produce, in one coordinated planning effort, a comprehensive plan that addresses like functions in a generic approach, and distinctly addresses the features that are hazard specific. Thus, funding for what had been solely nuclear attack preparedness planning will contribute to preparedness through planning for all hazards along with funding and assistance that had been previously provided specifically for hurricanes, earthquakes, and technological hazards. By integration of our total effort we are realistically supporting the overall development of a community's emergency capability to save lives regardless of the cause of the event. The capability to protect people also recognizes the only two options available regardless of the hazard, namely, evacuation or seeking protective shelter in-place. We believe such an approach as proposed for Population Protection Planning to be consistent with the Executive and Legislative mandates for the civil defense program to provide an improved ability to deal with natural disasters and other large-scale domestic emergencies.

Other program elements included in the Population Protection Program (i.e., Facility Survey, Engineering and Development, Shelter Preparation, and Protection of Industrial Capability) are also being modified to reflect the IEMS approach, as appropriate.

POPULATION PROTECTION CATEGORY

Question: What does your "population protection" category cover? Is it basically the old nuclear attack civil preparedness category?

Answer: No. The Population Protection Program includes program elements and activities that are much broader and more encompassing than Nuclear Attack Civil Preparedness. The latter was solely oriented to developing nuclear attack in-place protection and evacuation plans with planning efforts supported by building survey data, development of shelter stocks (including shelter marking, stocking, and ventilation), programs for protecting essential workers and industry, and support for the Individual Mobilization Augmentees. As noted in the previous question, the Population Protection Program, beginning in FY 84 will include an IEMS approach so that generic evacuation and in-place protection plans can be developed for all hazards facing a jurisdiction rather than nuclear attack only. Data to support the planning effort (i.e., identification of facilities required to protect people from nuclear attack effects and from natural disasters and technological hazards) will be obtained and shelter preparations implemented to mark buildings identified as shelters and to procure and stock life-support systems such as food, water, sanitation, ventilation components. Studies will also be continued to provide for the protection of industrial capability by protecting essential workers and industrial equipment against the blast and thermal effects of nuclear attack and natural disasters.

A comparison of the Nuclear Attack Civil Preparedness and Population Protection programs can be found on page SLA-37 of the FY 84 Budget Justification submitted to the Congress.

CIVIL DEFENSE — "DUAL" USE

Question: Which elements of the civil defense program relate only to nuclear attack preparedness and which are so-called "dual" use?

Answer: Most elements of the civil defense program still are multiple-use in nature. (The term multiple-use is preferable to dual-use, because the former suggests the broad spectrum of domestic hazards for which civil defense capabilities are required, including natural disasters and technological emergencies and disasters of a variety of types.) Most elements of the program have always been multiple-use in nature, and FEMA is acting to maximize the multiple-hazards application of the remaining elements, under the Integrated Emergency Management System (IEMS) approach.

The use of civil defense emergency facilities and systems in peacetime disasters is routine. The National Warning System (NAWAS) is used to warn localities of severe weather threats, and local civil defense siren systems are used to warn the people about approaching tornadoes. Key officials direct lifesaving operations from local Emergency Operating Centers during many types of emergencies, and emergency advice and instructions are transmitted to the public by local officials, using stations of the Emergency Broadcasting System. Radiological instruments and trained personnel provide support in road accidents or other emergencies involving radioactive materials. Without these basic capabilities, which are supported by civil defense funding, communities would find it much more difficult to deal with local emergencies.

The integrated approach is based upon the fact that these and other emergency systems and capabilities are inherently multihazard in nature. In addition, FEMA is acting to maximize the multiple-hazards payoff of all preparedness elements. For example:

- The current shelter survey will be broadened to an all-hazard survey, to identify protection against tornadoes, hurricanes, and other threats as well as nuclear attack effects.

- Relocation plans will be modified to take into account all types of hazards requiring evacuation such as a hurricane, toxic spill, flood, nuclear reactor accident, or a terrorist threat. Integrated plans will also provide for the care and sheltering of people in reception areas who have been forced to evacuate by any of a variety of hazards. (This could include, for example, care of people from an area severely damaged by an earthquake, until repair of damaged buildings and power lines made it safe for them to return.)

- Radiological defense officers will expand their ability to plan for and respond to all radiological hazards, such as major transportation accidents or other incidents that have potential for release of radioactive materials; accidents at nuclear power plants; and detonation of a nuclear weapon by accident -- as well as a nuclear attack on the United States.

- The use of shelter stocks and equipment will be examined for possible added benefits in local emergencies.

The above examples illustrate the potential for more effective emergency management inherent in an integrated system.

RADIOLOGICAL INSTRUMENTATION

Question: Your justification notes that radiological instrumentation is expected to increase during the period 1985-87. What specific activities do you anticipate during that period?

Answer: Specific activities include the following:

° We will initiate procurement of shelter sets. These sets would be composed of two high range carbon fiber low cost dosimeters (0-200R), one dosimeter/timer to be used as a rate-meter, and a charger for preparing both for operation.

° Complete the development, field test and pilot production of a low cost instrument that gives instantaneous readings of radiation levels (true ratemeter). In FY 1986, initiate procurement through the private sector of the required number needed for operational use.

° Complete the development, field test and pilot production of radiochromic waveguide dosimeters. Determine how many are to be used in shelter sets, postattack recovery sets and other operational sets. Since it is not reusable once exposed to radiation it will not serve as a complete substitute for the low cost carbon fiber dosimeter.

° Develop, field test and pilot produce a modern wide range survey meter for use by State and local emergency services organizations for both peacetime and attack caused radiological emergencies. This instrument replaces the current low range and high range instruments which are over 20 years old. Procurement commencing in FY 1988 is the goal of this effort.

° Extend the program to encompass emergency instrumentation needs for technological hazards for all types. As a start, a study will be made of the requirements for various instrumentation types in emergency operations.

FALLOUT FORECASTING

Question: In both FY 82 and FY 83, you contracted with the Weather Service for fallout forecasting. You have requested $15,000 for this activity in FY 84. Please describe the information derived under this activity. Why is an increase requested for FY 84?

Answer: Funding provides for twice daily collection of direction and speed of upper winds at 70 National Weather Service observatories, computer processing of the observed wind data for forecasts for 133 locations and nationwide distribution of forecasts twice daily over FAA teletypewriter service "C". This data is required by Federal, State, and local emergency management organizations to predict likely contaminated areas and arrival times of radioactive fallout from a nuclear weapon detonation. Daily nationwide distribution is essential because of probable Electromagnetic Pulse (EMP) damage to communication systems and other electronic equipment during an attack. Therefore, routine, nationwide distribution on a daily basis during peacetime is essential. This data is needed in connection with the conduct of post attack emergency operations and to make advisory self-protection information available to the public. It is also required for use in tests and exercises at all levels of government.

An increase of $5,000 is requested in FY 84 to cover the increase in costs from $10,000 to $15,000 to provide this service by the National Weather Service. Since the inception of the program in the 1960's, the cost to provide this data has not changed. In FY 1984, FEMA will reimburse the National Weather Services $15,000 which reflects the actual cost in 1984 dollars to provide continuation of the same services as in the past.

STATE AND LOCAL ASSISTANCE

Question: In FY 83 you requested $66.3 million for state and local assistance. Congress cut $11 million. In FY 84 you are requesting $65.8 million. Are any of these activities requested under the $65.8 million the same or basically the same as activities cut by Congress in FY 83?

Answer: Yes they are essentially the same, but the thrust is somewhat changed in nature. The program activities included under the State and Local Assistance (S&LA) program in the FY 1983 budget appear under two program headings in the FY 1984 budget: (1) State and Local Emergency Management, which includes the Emergency Management Assistance (EMA) program element and funds for reimbursement to the American Red Cross, and (2) State and Local Direction, Control and Warning, which includes the Maintenance and Services and the Supporting Materials elements. Those formerly S&LA activities total in the FY 1984 request $478,000 less than in the President's FY 1983 budget request and $11,040,000 more than the FY 1983 actual amount.

One change in emphasis is under Supporting Materials (now the State and Local Warning and Communications element—see pages SLA 60-62) where the objective is to develop State systems that are compatible with and can augment the National Emergency Management System as well as being dedicated, reliable, survivable and interlinked with other States. The Maintenance and Services element is now under Other State and Local Direction, Control and Warning, which also includes damage estimation and reporting (see pages SLA 63-65).

The FY 1983 cuts were felt hardest in the warning and communications activities, further increasing the need for equipment repair or replacement to maintain a capability to deliver warning and information in emergencies. Nevertheless, the 1983 actual funding under Maintenance and Services and Supporting Materials plus the counterpart requested amounts for FY 1984 total only a million dollars more than the combined 1983 requests. FEMA is requesting some 28 percent less for these two activities in FY 1984 than it sought in 1983.

As for the other State and Local Assistance program elements in FY 1983, EMA—the lifeblood of State and local emergency management capability—would be increased 10.2 percent over the actual 1983 funding. While more specific emphasis is to be placed on productivity, the main effect of the increase would be to more nearly restore this element to the 50-50 match anticipated in the authorizing legislation. State and local cost sharing for these personnel and administrative expenses exceeds the FEMA share in most States, and much activity particularly among local jurisdictions has been curtailed.

ENHANCED POPULATION PROTECTION EFFORT

Question: Your justification indicates an intent "to implement an enhanced population protection effort beginning in 1984." What do you mean by an "enhanced populaton protection effort"?

Answer: In FY 1984, FEMA will implement an Integrated Emergency Management System (IEMS) approach to developing Population Protection Plans to protect the populace against the effects of natural disasters, technological hazards, and nuclear attack. This is viewed as an "enhancement" of previously developed plans under this program dealing solely with nuclear attack. Emphasis will be on the use of State planners working in conjunction with local officials to develop generic evacuation and in-place protection plans for jurisdictions subject to these disasters. Elements common to all emergencies will be addressed in the generic plans covering mitigation, preparedness, response, and recovery phases. Each participating jurisdiction will be required to conduct a hazard/vulnerability analysis to identify the hazards likely to affect the community and the impacts of such hazards. Population Protection Plans will be developed as a direct response to the hazard/vulnerability analysis.

SECURITY PLANNING

Question: If FEMA tasks another agency having inventigative or intelligence-gathering authority to collect information, will the appropriate oversight committees of Congress such as the Senate Select Committee on Intelligence be informed?

Answer: FEMA does not intend to task any agency to collect information. Rather, tasking will be in the form of requests for formal estimative products analogous to a National Intelligence Estimate (NIE), but dealing with civil security threat or a Special National Intelligence Estimate (SNIE) focusing on a particular aspect of a given threat. In addition, FEMA might also levy standing requirements cast in a form similar to Essential Elements of Information (EEI) to guide those who acquire threat information.

Prior to tasking any organization that is in a position to supply threat assessment information, prearranged agreements to do so will be finalized. FEMA will coordinate with the respective agencies to ensure that the proper oversight committees of Congress are informed, as may be required.

Question: Has FEMA received any information or allegations indicating that any of its employees may have engaged in any type of investigative or intelligence-gathering activities during the past few years? If so, please provide the details of when the incident occurred, why it occurred, who were the subjects of collection, and what methods of collection were used.

Answer: No. The Federal Emergency Management Agency is not now and will not become an intelligence gathering agency. The only incident that we are aware of that could possibly have been misinterpreted as "collecting intelligence" is an occasion on which an employee openly attended a public meeting of a survivalist group to obtain impressions for a paper he was writing.

The agency policy is firm and clear and has been expressed frequently by the Director to other agency heads and in frequent public utterances.

FIRE PREVENTION AND CONTROL

Question: Do you see firefighter health and safety as a continuing priority or do you believe you have accomplished your principal goals in this field and can turn your focus to other areas, such as arson?

Answer: Firefighter Health and Safety is a continuing priority of the U.S. Fire Administration. In addition to the projects on which we are currently working, there are many more which must be addressed in the future. For example, hazardous material incident exposure protection gear; improved self-contained breathing apparatus; medical treatment of smoke and toxic gas victims; improved communication equipment; improved tools and equipment; improved analysis of the causes of firefighter casualties; development of a group of health and physical fitness programs; research on toxic gas analysis; and encouragement for the development and improvement of automatic fire protection devices, which will transfer part of the burden from manual firefighters.

Question: Your justification seems to suggest an increasing emphasis on arson prevention. Is this correct? Are other departments and agencies also involved?

Answer: Yes, with support of Congress, increased emphasis is being placed in the area of Arson Prevention. Previous efforts have been directed at the urban problem, but now we are involved in a phased project which is geared toward the rural arson program, which is significant. Members of this task force represent all Federal agencies that have fire prevention and control programs. It is also important to mention that we are going on the air via satellite in the fall to present a nationwide teleconference on the subject of "Arson Task Forces." The FBI-Federal Bureau of Investigation, BATF-Bureau of Alcohol, Tobacco and Firearms, NBS-National Bureau of Standards, and other members of the Federal Arson Task Force will be lending their expertise and technical assistance to this important FEMA project.

Question: Will FEMA be involved in any training activities for local firefighters in FY 84?

Answer: Yes, FEMA will continue a number of significant training activities as well as pursuing new efforts. For example, we support an apprenticeship program for training and certification of local fire department personnel. We have the National Fire Academy that provides training at the National Emergency Training Center in Emmitsburg, Maryland, and in the field to over 14,000 students a year. We develop, print and disseminate publications, procedures and recommendations on fire prevention and control programs that are used by local firefighters all over the country.

Question: In your justification, you list as one of the 1983 objectives, the identification of model programs that can be transferred to state and local fire services in fire prevention and arson control. How do you go about (a) identifying such programs, and (b) transferring the relevant data?

Answer: There are various means by which model programs may be identified. For example, we learn of many through routine telephone conversations with state and local people; from students in both the resident and field programs of the National Fire Academy; the member associations of the Joint Council of Fire Services Organizations are active in working with their constituencies and as a result are made aware of unique and proven cases. Many of the United States Fire Administration programs are geared to the development and/or discovery of successful, proven programs in the field. These are a major source of our identification of model programs.

The staff of the United States Fire Administration and the National Fire Academy work together to develop the best method of transferring relevant data to the nation's fire service. This is accomplished by resident and field courses; visual aids; publications; technical assistance; and other developmental programs.

Question: Are you coordinating your activities with other departments and agencies? How?

Answer: Yes, we are. The U.S. Fire Administration coordinates its programs and activities with other FEMA program offices as well as with appropriate Federal, State and local organizations. We conduct jointly funded projects with National Aeronautics and Space Administration, the Consumer Product Safety Commission, Department of Agriculture, Bureau of Mines, Department of Labor, Bureau of Standards, Department of Defense, the Coast Guard, National Institute of Occupational Safety and Health and all other Federal agencies which serve on the Federal Arson Task Force.

Jointly funded projects are as follows:

National Aeronautics and Space Administration - Communications Equipment and Protective Gear

Consumer Product Safety Commission - Fire Incident Data

Agriculture - Rural Fire Problem

Bureau of Mines - Breathing Apparatus Development

Labor - Apprenticeship Program

Bureau of Standards - Fire Research

Department of Navy - Communications Equipment

We also conduct jointly funded projects with the National Aeronautics and Space Administration, the Consumer Product Safety Commission, Department of Agriculture, Bureau of Mines, Department of Labor, Department of Defense, the Coast Guard, National Institute of Occupational Safety and Health, and others.

NATIONAL FIRE ACADEMY

Question: What was your request to OMB for the National Fire Academy in FY-84?

Answer: Our request was for $6,921,000

Question: Your justification indicates the Academy receives three times as many applications as can be accommodated. How do you determine which applications to accept?

How many did you turn down in FY 82? FY 83?

Answer: Each course has established qualification standards and selection criteria which are published in the course catalogs and announcements. Student applications must first meet the criteria, and then the courses are filled by qualified students on a first come-first serve basis. We estimate that we were not able to accept over 4,000 student applications in FY-82 and 2,200 in FY-83 so far.

Question: The justification for the Academy notes that there is a reduction in course offerings planned for FY-84 because "level funding precludes our ability to respond to increased adjunct and stipend costs." Please elaborate on the adjunct and stipend costs.

Answer: Because adjunct (contract teachers) and stipend (student transportation) costs increase each year, level funding in FY-84 requires other efficiency measures to maintain the same level of training. We have done this by combining courses previously offered individually into one offering, e.g., Arson Detection Programs and Public Fire Education Programs.

DOSIMETER PRODUCTION - A-76 COST COMPARISON

Question: Why did FEMA not do an O.M.B. Circular A-76 cost comparison between private sector research and development of a low cost dosimeter before making its decision to do this work in-house?

Answer: FEMA's decision to do pilot production at a facility supervised by the Government was dictated by technical factors related to research and development rather than comparative cost. OMB Circular A-76, paragraphs 4.b. and 5.f. (3) does not require a cost comparison for in-house core research and development.

Limited prototype production by FEMA will enable FEMA to translate its laboratory fabrication into a practical production mode. This will enable FEMA to develop appropriate and accurate specifications and acceptance tests for competitive procurement in the private sector. The private sector will then be able to better achieve accurate mass production. This will improve the quality of dosimeter production by the private sector.

The pilot production at Rolla, North Dakota is to be done in a plant, privately owned by the Rolla Development Corporation, operated by the Bulova Watch Corporation, and leased to the Government. The Chippewa Indians and others to be employed will not be Federal employees.

DOSIMETER PRODUCTION

Question: In the early 1960's the Federal Government had contracted with a division of the Bendix Corporation to do research and development on dosimeters, and, in conjunction with the current in-house FEMA research, part of the research was contracted with Monsanto. In 1976, FEMA's predecessor (The Defense Civil Preparedness Agency) had decided to have the production engineering phase of R&D done in the private sector. Why now with this precedent has FEMA decided to do the research, development, and production of dosimeters in-house? If it was not a "governmental function" or core capability in the Bendix research, the Monsanto plastic research, and in your own 1976 decision, how can it be core capability now?

Answer: Although FEMA could contract out its core research capacity, the Agency decided to do the work in-house due to past experience. FEMA's predecessor agency, Defense Civil Preparedness Agency (DCPA) found serious performance problems with dosimeters bought in the early 60's. Other Federal agencies had similar problems during the 70's. By July 1976, DCPA decided to do research in-house to design a reliable dosimeter capable of low-cost mass production and competitive procurement. In 1981, FEMA had a preliminary design using special plastics, carbon microfilaments, epoxy resins and other state-of-the-art materials and techniques.

FEMA has now made 300 instruments of the new design but under laboratory conditions using skilled technicians. In FY 1981, the Agency decided to have an in-house pilot production run for research and development to translate laboratory work into mass production techniques. Government personnel must scrutinize all manufacturing processes to locate the problems and determine what specifications and acceptance tests would assure that such problems had been eliminated. Without the closely monitored production experience, FEMA could not prepare specifications and testing adequate to ensure that a competitive, private sector procurement would result in accurate, rugged dosimeters which would last long under adverse conditions. Currently, FEMA lacks a finalized dosimeter design and only has specifications incorporating outmoded technologies.

When Bendix did dosimeter development under an FY 1962 contract, they failed to provide information about the electrometer and condensers, which are the most critical components of the instrument. The Bendix contract report did not release data on plastic insulators and associated techniques. Defects in the listed components still cause problems for dosimeter purchasers. This experience was considered when DCPA decided in 1976, to do the design work in-house.

DCPA also contracted with Monsanto Research to produce a radiation resistent plastic which makes the new design possible. The plastic technology has been available to the private sector since August, 1971.

Question: Since private companies already have much of the machinery which is being purchased by FEMA, the physical plant, the trained personnel, and the production experience, wouldn't it have been less costly to contract the production engineering work with a private company?

Answer: Past experience has shown that with presently used dosimeter designs, a large proportion of the units produced by private companies fail even the initial acceptance tests. Many other units fail after use. The processes used in making the new FEMA design are quite different from existing technology. FEMA has not yet finalized the design, especially with the high range dosimeters. FEMA now lacks the knowledge to draw up specifications or prescribe quality assurance and acceptance test procedures. If FEMA were to contract out the pilot production run, FEMA would not have an adequate design or even performance specifications to enable a contractor to estimate its costs in advance. By having a closely observed pilot production run, FEMA can acquire the know-how to draft the specifications, so as to assure reliable performance in the field.

Cost was not the deciding factor in using the Rolla plant. FEMA's main purpose in conducting the pilot run was to finalize designs and specifications and to be able to have a data and design package to allow full and free competition within the private sector when FEMA makes its major procurement of dosimeters.

Question: If FEMA intends to produce only 20,000 dosimeters at the Rolla plant, why is it going to expend $1.6 million in rent over 10 years and an additional $3 million for this project which would create a capability for 1 million units per year per shift, or 30 million units from a potential of 3 shifts over 10 years over the ten-year life of the lease?

Answer: Originally, the Government had planned for a mobilization base production capability where production could be surged to a million units per shift per year during periods of increased international tension. However, FEMA now plans to produce 20,000 units in FY 1983 on a pilot production basis. The FY 1984 budget calls for continuation of the pilot production research and development until all the technical problems are worked out. Also, the Rolla plant will be used to support other developmental projects now in the R&D design phase. FEMA has changed the original plans for meeting needs by relying on a mobilization surge production capability at Rolla, to current plans that rely on the private sector to meet the Government's on-going needs and procure in advance of an international crisis. This change of plans clearly benefits private industry. Pilot production will constitute a small fraction of the projected National needs.

Tooling currently scheduled for the Rolla plant is estimated to be able to produce a maximum of 150,000 units per shift per year. However, the Rolla plant capacity will be limited only to meeting pilot production objectives, solving development and quality assurance problems in low-cost development that will serve in preparing procurement specifications, and addressing mass production and testing problems that occur in the private sector.

Total costs for the Rolla facility are projected at $3 million total (not $3 million plus an additional $1.6 million as stated by the question). The $1.6 million rental is included in the $3 million total cost. Current planning calls for the Rolla plant to conduct pilot production on other radiation instruments now in the design stage. FEMA does not plan to make or even have capacity for making 30 million units at Rolla.

Question: Can the FEMA production engineering be accomplished in a private facility?

Answer: The pilot production and associated developmental activities are being performed in-house rather than by contract to the private sector. The essential reason for performing this portion of development in-house is neither predicated on the ability of a few firms in the private sector to do the work nor on costs. The reason is that it is only through an in-house effort that the Government can have the required control to experiment and modify, as necessary, the production procedures, materials, and design features necessary to achieve the desired end product - a dosimeter meeting our reliability and cost objectives. Such control is essential to our being able to write the detailed production specifications which are the key to an open and fully competitive procurement from the private sector.

We feel the decision to do the pilot production phase of dosimeter development in-house is in the best interest of the government because it serves to assure an open competitive procurement of mass production. The expenditures for our pilot production effort will pay off in reduced expenditures in the mass production phase. This approach is not injurious to the private sector since it widens opportunities for participation, especially for small and minority-owned businesses. We have shared this approach with a number of interested companies. Their responses have been overwhelmingly positive.

If a private industry contractor was to do the pilot production run which would result in a production technical data package, specifications and acceptance tests, then organizational conflicts of interests doctrines would preclude that contractor from being allowed to compete for any follow-on production contracts. Having a well qualified private firm do pilot production would mean that such a firm would be eliminated from the large quantity purchase.

Question: It has been the policy of the Federal Government to rely on private enterprise to provide commercial goods and services and not start or carry on any activity to provide a commercial product or service if the product or service can be procured more economically from the private sector. OMB Circular No. A-76. Doesn't this action of FEMA fly directly in the face of that policy? Doesn't it also fly in the face of government policy and FEMA regulations to be mindful to protect the interest of small businesses and to assure the maximum participation of small business in the mobilization base? FEMA Regulation Section 321.6.

Answer: Although, OMB Circular A-76 (para. 4.a.), provides that the private sector should be relied upon to provide industrial and commercial goods, the Circular goes on to provide that certain functions are so intimately in the public interest, as to mandate performance by the Federal sector (para. 4.b.). Among these functions are core research and development capability (para. 5.f.(3).).

As previously mentioned, FEMA has not yet completed the design and the writing of the specifications for the plastic dosimeter. Only by having a closely monitored, in-house pilot production run will the Government be able to complete the design, specifications, and quality assurance work. After the pilot production run, FEMA will be able to make the technology available so that FEMA and other Government agencies can purchase dosimeters in large quantities from the private sector. By having pilot production done in-house under close Government control and supervision, FEMA reduces the risk to industry which would have to use unproven processes. The technology developed by FEMA would be available to all companies including minority and disadvantaged-group owned businesses.

FEMA has widely shared its know-how with the private sector. A number of companies were sent copies of drawings and materials including Dosimeter Corporation of America. The following companies have visited the FEMA Emergency Management Systems Test Facility where extensive briefings on dosimeter manufacture were given:

Beekman Industries, Cincinnati, Ohio
Victoreen Co., Inc., Cleveland, Ohio
William B. Johnson & Associates, Montville, New Jersey
RADCAL Corporation, Monrovia, California
Far West Technologies, Goleta, California

All of these companies praised FEMA's work. One of FEMA's leading dosimeter scientists, Burton J. Thompson, spent 2 1/2 days with the Dosimeter Corporation of America, answering detailed questions on every aspect of the new design.

DAM SAFETY PROGRAM

Question: Under your dam safety program for FY 1984, you refer to continued financial assistance to States for the development of strong State dam safety programs. Furthermore you note that States "potentially targeted" for assistance include Kentucky. What do you envision doing in Kentucky under this activity?

Answer: In FY 1984, as in FY 1983, FEMA will provide support to States for development and strengthening of dam safety programs. As funds are limited, States will be required to compete for funding assistance. States will submit proposals for tasks which will strengthen specific deficiencies in their existing dam safety programs. These proposals will be reviewed by an independent panel, which will award funds based on need and quality of the applications. Kentucky, along with several other States, was identified as potentially targeted for financial assistance because it has a large number of unsafe dams. Kentucky, along with other affected States will be encouraged and assisted in applying for these funds.

UNSAFE DAMS

Question: In your dam safety section, you refer to a preliminary priority listing of unsafe dams developed by the Corps of Engineers. How many dams are on the list and what was the criteria for including them?

Answer: The National Dam Inspection Act of 1972 (P.L. 92-367) directed the Secretary of Army, acting through the Chief of Engineers, to carry out a National Program of Inspection of Non-Federal Dams. Approximately 2,000 were classified as being unsafe; of these 132 were determined to be in a state of emergency, that is their failure was imminent. During the inspection, a dam was labeled unsafe if all of these conditions were present:

- The dam presents a high hazard potential to downstream development;
- The dam cannot pass one-half the probable maximum flood without overtopping, and there is a reasonable probability that overtopping would cause the dam to fail;
- Failure of the dam would significantly increase the potential for loss of life downstream from the dam.

MISSISSIPPI COAST VULNERABILITY ANALYSIS

Question: In 1983 under the hurricane program, you initiated a vulnerability analysis of the Mississippi Coast What is the status of the report? What do you intend to do once the report is completed?

Answer: The Mississippi Coast project is the tri-state hurricane preparedness planning project for the Florida panhandle, Alabama and Mississippi Coasts. FEMA's Regional office is determining the scope of the vulnerability study and establishing the management framework necessary for the project. At present, FEMA anticipates contracting with the Army Corp of Engineers for the initial phase of the study.

Upon completion of the vulnerability analysis, an evacuation plan will be developed and tested.

QUESTIONS SUBMITTED BY SENATOR WEICKER

DOSIMETER PRODUCTION - A-76 COST COMPARISON

Question: Did FEMA conduct an OMB Circular A-76 cost comparison prior to making its decision to perform research and development functions relating to low-cost dosimeters in-house?

Answer: FEMA's decision to do pilot production at a facility supervised by the Government was dictated by technical factors related to research and development rather than comparative cost. OMB Circular A-76, paragraphs 4.b. and 5.f (3) does not require a cost comparison for in-house core research and development.

It is only through an in-house effort that the Government can have the required control to experiment and modify as necessary, the production procedures, materials, and design features necessary to achieve the desired end product - a dosimeter meeting our reliability and cost objectives. Such control is essential to our being able to write the detailed production specifications which are a key to an open and fully competitive procurement from the private sector.

DOSIMETER PRODUCTION

Question: Since private companies that have been conducting research and development on dosimeters since the 1960's already have much of the machinery which is being purchased by FEMA, the physical plant, the trained personnel, and the production experience, wouldn't it be less costly to contract the production engineering work with a private company?

Answer: Past experience has shown that with presently used dosimeter designs, a large proportion of the units producted by private companies fail even the initial acceptance tests. Many other units fail after use. The processes used in making the new FEMA design are quite different from existing technology. FEMA has not yet finalized the design, especially with the high range dosimeters. FEMA now lacks the knowledge to draw up specifications or prescribe quality assurance and acceptance test procedures. If FEMA were to contract out the pilot production run, FEMA would not have an adequate design or even performance specifications to enable a contractor to estimate its costs in advance. By having a closely observed pilot production run, FEMA can acquire the know-how to draft the specifications, so as to assure reliable performance in the field.

Cost was not the deciding factor in using the Rolla plant. FEMA's main purpose in conducting the pilot run was to finalize design and specifications and to be able to have a data and design package to allow full and free competition within the private sector when FEMA makes its major procurement of dosimeters.

DOSIMETER PRODUCTION - ENGINEERING

Question: Can the FEMA production engineering be accomplished in a private facility?

Answer: The pilot production and associated developmental activities are being performed in-house rather than by contract to the private sector. The essential reason for performing this portion of development in-house is neither predicted on the ability of a few firms in the private sector to do the work, nor on costs. The reason is that it is only through an in-house effort that the Government can have the required control to experiment and modify, as necessary, the production procedures, materials, and design features necessary to achieve the desired end product - a dosimeter meeting our reliability and cost objectives. Such control is essential to our being able to write the detailed production specifications which are the key to an open and fully competitive procurement from the private sector.

We feel the decision to do the pilot production phase of dosimeter development in-house is in the best interest of the government because it serves to assure an open competitive procurement of mass production. The expenditures for our pilot production effort will pay off in reduced expenditures in the mass production phase. This approach is not injurious to the private sector since it widens opportunities for participation, especially for small and minority-owned businesses. We have shared this approach with a number of interested companies. Their responses have been overwhelmingly positive.

If a private industry contractor was to do the pilot production run which would result in a production technical data package, specifications and acceptance tests, then organizational conflicts of interests doctrines would preclude that contractor from being allowed to compete for any follow-on production contracts. Having a well qualified private firm to do pilot production would mean that such a firm would be eliminated from the large quantity purchase.

DOSIMETER PRODUCTION - ROLLA PLANT

Question: As I understand it, FEMA intends to produce only 20,000 dosimeters at the Rolla plant. If so, why is the Agency planning to expend $1.6 million in rent over ten years and an additional $3 million for this project? In fact, why is GSA negotiating on behalf of FEMA for a ten-year lease for facilities related to dosimeter production?

Answer: Originally, the Government had planned for a mobilization base production capability where production could be surged to a million units per shift per year during periods of increased international tension. However, FEMA now plans to produce units in FY 1983 on a pilot production basis. The FY 1984 budget calls for continuation of the pilot production research and development until all the technical problems are worked out. Also, the Rolla plant will be used to support other developmental projects now in the R&D design phase. FEMA has changed the original plans for meeting needs by relying on a mobilization surge production capability at Rolla, to current plans that rely on the private sector to meet the Government's on-going needs and procure in advance of an international crisis. This change of plans clearly benefits private industry. Pilot production will constitute a small fraction of the projected National needs.

Total costs for the Rolla facility are projected at $3 million (not $3 million plus an additional $1.6 million as stated by the question). The $1.6 million rental is included in the $3 million total cost. Current planning calls for the Rolla plant to conduct pilot production on other radiation instruments now in the design stage.

The ten-year lease arrangement is not a programmatic requirement. It is based on the economics of leasing as determined by specialists of the General Services Administration (GSA). If the lease were for a shorter term the annual rent would be proportionately higher. We are told that the premature termination costs for a ten-year lease would be less than for any shorter term lease. We are not leasing the facility for dosimeter production in competition with the private sector. It is for pilot production and prototype development only.

It will not be used for end products otherwise obtainable throught the private sector in mass production procurements. We have given such assurances to both the Senate and House Appropriations Committees concerned with this portion of the FEMA budget.

DOSIMETER PRODUCTION
GOVERNMENT POLICY

Question: It has been the policy of the federal government (OMB Circular A-76) to rely on private enterprise to provide commercial goods and services. In your opinion, doesn't this action on dosimeters directly counter that longstanding policy? Do you believe that it further contradicts government policy and FEMA regulations aimed at maximizing participation of small business in government contracting?

Answer: Although, OMB Circular A-76 (para. 4.a.), provides that the private sector should be relied upon to provide industrial and commercial goods, the Circular goes on to provide that certain functions are so intimately in the public interest, as to mandate performance by the Federal sector (para. 4.b.). Among these functions are core research and development capability (para. 5.f.(3)).

FEMA has not yet completed the design and the writing of the specifications for the plastic dosimeter. Only by having a closely monitored, in-house pilot production run will the Government be able to complete the design, specifications and quality assurance work. After the pilot production run, FEMA will be able to make the technology available so that FEMA and other Government agencies can purchase dosimeters in large quantities from the private sector. By having pilot production done in-house under close Government control and supervision, FEMA reduces the risk to industry which would have to use unproven processes. The technology developed by FEMA would be available to all companies including minority and disadvantaged group owned businesses.

FEMA has widely shared its know-how with the private sector. A number of companies were sent copies of drawings and materials, and many have visited the FEMA Emergency Management Systems Test Facility where extensive briefings on dosimeter manufacturing were given.

NEIGHBORHOOD REINVESTMENT CORPORATION

STATEMENT OF WILLIAM A. WHITESIDE, EXECUTIVE DIRECTOR

ACCOMPANIED BY:
- **MARGARET FRISBEE, DIRECTOR, PROGRAM SERVICES**
- **O. GEORGE KNIGHT, DEPUTY EXECUTIVE DIRECTOR FOR FIELD OPERATIONS**
- **DONNIE BRYANT, DIRECTOR, FINANCE AND ADMINISTRATION**
- **CAROL McCABE, GENERAL COUNSEL**
- **NATHAN NICHOLS, DIRECTOR, FIELD SERVICES**

BUDGET REQUEST

Senator GARN. The subcommittee will come to order.

I am pleased to have the Neighborhood Reinvestment Corporation representatives here. Last year I introduced you by saying that you were one of the few agencies under our jurisdiction that was experiencing real growth. In fiscal year 1983, your direct Federal appropriations increased by 11.8 percent over your fiscal year 1982 level.

This year, however, you are faced with a different situation. Your fiscal year 1984 request is for $15,512,000, the same as appropriated in fiscal year 1983. In addition, your budget justification projects a reduction of $1.8 million in nonappropriated funds. So under your current request, you will be operating under a relatively austere budget. I am interested in hearing what you expect to be able to accomplish during fiscal year 1984 under this budget and will be pleased to hear any remarks you have.

OPENING REMARKS OF WM. A. WHITESIDE

Mr. WHITESIDE. Thank you very much, Mr. Chairman.

I will just very briefly summarize the submitted testimony.

I think the most important point I can make for you is that Neighborhood Housing Services (NHS) programs are now operating in 185 neighborhoods in 134 cities and proving themselves very resilient in the difficult times we have been experiencing. They have survived and continue to produce for their neighborhoods, against considerable odds. I think a lot of people wouldn't have given them a very good chance to have done that a few years ago.

I have also focused in my testimony on the apartment improvement program which is operating now in 15 communities. With the reduction in interest rates, it is now able to start a leap forward that was very difficult during the past year.

I commented on our owner-built housing program, which has been a tremendously effective program to provide affordable housing for neighborhood residents. It serves to highlight the NHS as a program which involves people from the community, which is producing unusually productive results for the residents.

Our mutual housing association demonstration remains, I think, one of the most promising things we have taken on as a demonstration. The going has been very slow. We see eight units being started during this spring in our Baltimore demonstration, and a further eight during the summer. We are also very encouraged by the response in Cleveland, where significant funding resources appear to be available for the capital grants required.

We have been able to provide considerable assistance to NHS's in securing operational funding during the past year, partly through Neighborhood Housing Services of America. This includes training for the NHS's in how to conduct fund raising in an environment where they have been required to considerably broaden their funding bases in order to continue to operate. It also includes direct assistance to some programs where that was the only way for them to achieve the results they needed. Work is progressing on fund raising for the NHS secondary market. We see a need for the balance of the eighties of between $50 and $150 million in funding for the secondary market, which is totally out of the bounds of what our budget can provide. We see this being provided through a combination of social investments by private institutional investors, the early ones that have come forward being insurance companies, combined with private contributions to defray the costs of operating the secondary market and to cover the subsidy funds and the guarantee funds needed.

One of the most promising things that has happened in relation to this fund-raising effort, both locally and nationally, is that the Advertising Council, a national group representing advertisers throughout the country, has taken on NHS as one of its highly select group of causes to promote. They will be making NHS a household word, first in the business community, promoting NHS as something in which the business community can get involved, broadening the financial base of the program, and second, as a national campaign to intensify public awareness of the need to improve neighborhoods—to revitalize the existing neighborhoods and housing stock.

We come to you, as you noted, Mr. Chairman, with a $15.5 million request. This does represent a tight budget year for us in view of the $1.8 million drop in other income.

With that, I would be pleased to take questions.

REPROGRAMING

Senator GARN. Thank you.

On February 15, March 14, April 11, and April 14, we exchanged a series of letters concerning the role of this committee in reviewing and approving the reprograming requests of the Corporation. As you know, Chairman Boland and I take our oversight responsibilities rather seriously, and reprograming, I believe, represents a particularly important part of that oversight.

So, I hope you understand it is not my intent to try to manage the Corporation on a day-to-day basis, but only to insure that congressional intent is followed and the appropriations bill is carried out as we pass it.

Mr. WHITESIDE. Thank you, Mr. Chairman. I do understand that.

MUTUAL HOUSING ASSOCIATIONS

Senator GARN. As you note in your opening statement, there is a commited group of mutual housing association members in Baltimore waiting to occupy units which have been planned. You further note that your ability to begin one or more additional mutual housing demonstrations and your ability to build the planned units in Baltimore depend upon the the availability of Government and foundation resources.

Does this imply that no additional mutual housing associations will be started until the Baltimore project is completed or the financing is in place?

Mr. WHITESIDE. There are two aspects to developing the mutual housing association. One is the long educational process of developing the association itself, getting a group of neighborhood leaders, business community representatives, people from local government, normally drawn from the NHS partnership, and potential residents of the mutual housing association involved in a partnership board ready to undertake a process of producing and operating housing for the benefit of its members. The second phase is the construction phase, the phase involving a capital grant to cover the necessary subsidy for the lower income residents. We have never been funded for the second phase. We have entered into the demonstration on the basis that we would seek funding from foundation resources, business and local governments to get into some minimal demonstration phase of actual bricks and mortar. We found this extremely difficult in a year where private foundations and corporate foundations have been really stretching to meet the increased needs for the private sector to fund social concerns. So, it is slow going in terms of actually getting in the bricks and mortar.

The first eight units in Baltimore are being produced with the assistance we have provided, city government assistance and State of Maryland assistance, and some operating help from one of the very few foundations located there.

We have had a request from Cleveland to begin work on a mutual housing association there. They have pulled together a group of foundations, corporations, and the local government which have indicated a willingness to raise the funds to cover this capital grant aspect for a significant number of units. And we are very encouraged by that, although we are still in a phase of assessment of the resources. I rather think we will go forward with that. We are moving into other demonstrations very cautiously, given the experience in Baltimore and the lack of foundation and Government resources for carrying on the more expensive parts of the demonstration.

Senator GARN. When do you expect the first occupancy in Baltimore?

Mr. WHITESIDE. The end of this year or the first month or two of the next year. We expect to be in construction by July.

Senator GARN. In your February 15 reprograming letter, you requested that $487,000 from fiscal year 1982 be used for new project starts. In my response, I suggested that a substantial portion of these funds should be made available to your mutual housing program. I made this suggestion because I felt that your first responsibility was to the people waiting to occupy that project.

On April 11, you informed me that the the directors chose to allocate the funds to new starts, a small amount to the mutual housing program, and some $87,000 to a contingency reserve.

If most of the funds were used for mutual housing, what could have been accomplished, both in terms of units produced and time of occupancy?

Mr. WHITESIDE. It would have produced 10 to 12 additional units, and the board's decision, I think, was based upon the much larger impact that those funds would have in other areas. We found as we surveyed our activities for the coming year that by stretching the staff we had the ability, if we only had the grant resources, to start a couple more NHS programs and two or three more of these valuable component programs for a marginal increase in cost. So, it gave us a very large bang for the buck there, and that was the determination the board made.

Senator GARN. Do you expect to use the contingency funds in fiscal year 1983?

Mr. WHITESIDE. I can't say at this date.

RURAL NHS DEVELOPMENTS

Senator GARN. During fiscal year 1983, rural NHS developments in Wisconsin and Vermont are expected to be completed. You note in your justification that the experience with these two rural developments, coupled with the operational experience in rural New York, will allow you to make a preliminary evaluation of the effectiveness of the NHS partnership approach in a predominantly rural setting.

What can you tell the subcommittee now about the unique problems encountered by the NHS approach in rural settings and what implication does this have for your future activities?

Mr. WHITESIDE. We have currently in development or in operation five rural adaptations of NHS. The one you mentioned in Vermont, which is a statewide structure, focuses neighborhood by neighborhood in rural areas, or community by community. Rural adaptations in Mabton, Wash., Richland Center, Wis., Cattaraugus County, N.Y., and Clackamas County, Oreg., were each made possible by a special funding opportunity—some HUD funds, as a direct grant, a small cities grant, State grants, and in every case we believe that the NHS job is performable in the rural setting. We haven't had a chance to get a lot of track record and testing of this, but it appears that working with a rural community is not that much different than working with an urban community. The thing that is different is the lack of resources. Even in a small city you have a number of locally headquartered banks and savings and loans and some corporate base. In larger cities, you have very substantial bases. In rural areas, the source of private contribution support is very, very limited.

The most hopeful response we have seen to this is the Vermont statewide approach, where you can conduct statewide fund raising for targeting neighborhood by neighborhood in different locations throughout the State. Overall, we see this as a significant expense to be borne by some level of government, and one that, frankly, we are a little uncomfortable with, because the thing that has made NHS so successful has been its private nature, the concern that the partners have felt for the success of the program, the fact that it was not subject to the ups and downs of Federal funding. So to see a substantial number of NHS's get started in a rural area that doesn't have those advantages is something we are approaching very cautiously.

PREPARED STATEMENT

Senator GARN. I understand you have submitted your prepared statement for inclusion in the hearing record. Without objection, it will be inserted at this point in the record.

[The statement follows:]

STATEMENT OF WILLIAM A. WHITESIDE

Mr. Chairman, it is a pleasure to come before you in support of our Fiscal Year 1984 budget request of $15,512,000. Before summarizing our budget request and commenting upon our overall resources and our proposed output, I would like to briefly summarize for the Committee the purposes for which Congress created the Neighborhood Reinvestment Corporation.

NEIGHBORHOOD REINVESTMENT CORPORATION ACT

After beginning our work as an office of the Federal Home Loan Bank Board, and four years of operation under the Urban Reinvestment Task Force (a task force made up of the Chairman of the Federal Home Loan Bank Board, the Secretary of HUD, a member of the Board of Governors of the Federal Reserve System, the Chairman of the Federal Deposit Insurance Corporation, and the Comptroller of the Currency), the Neighborhood Reinvestment Corporation Act established the Corporation to implement and expand the demonstration activities of the Urban Reinvestment Task Force. These activities included establishing Neighborhood Housing Services (NHS) programs in neighborhoods throughout the United States, monitoring their progress and providing them with grants and technical services. In addition, the Corporation was directed to continue the work of the Task Force in identifying and assisting selected Neighborhood Preservation Projects offering promise as mechanisms for reversing neighborhood decline and improving the quality of life, and to bring such successful projects to neighborhoods throughout the United States. The Corporation was directed to continue supporting Neighborhood Housing Services of America, including providing technical assistance and grants to expand its capacity to purchase NHS revolving loan fund loans and to contract with Neighborhood Housing Services of America for services which it can perform more efficiently or effectively than the Corporation.

NEIGHBORHOOD HOUSING SERVICES

Neighborhood Housing Services programs are state-chartered, nonprofit corporations governed by boards of directors representing a partnership of neighborhood residents, local business leaders and local government, with the objective of revitalizing declining neighborhoods. The programs' operating budgets are funded by voluntary contributions, primarily from local businesses. Their revolving loan funds are capitalized by seed grants from the Neighborhood Reinvestment Corporation matched many times over by local governments, foundations and businesses. Each NHS operates in one or more neighborhoods with defined boundaries characterized by a housing stock showing evidence of deterioration and lack of maintenance, an inadequate degree of mortgage and home improvement activities, a substantial degree of homeownership, and an income mix in the neighborhood as low as resources will permit (i.e., the lower the family incomes and/or the higher the repair costs, the greater the resources needed for revolving loan funds and staffing). NHS neighborhoods average 2,500 dwelling units.

Each local NHS board of directors manages the affairs of its corporation. It is responsible for keeping in place the resources necessary to operate the NHS program, including loan fund operating budgets. The board is responsible for insuring proper financial management, designating target areas, reaching agreements with local government on appropriate code inspection services and public improvements, and designing creative strategies to accomplish particular neighborhood objectives. The NHS staff implements policies of the board of directors, providing neighborhood residents with the following services: financial counseling, referrals to financial institutions for mortgage and home improvement loans, rehabilitation counseling and construction monitoring, and access to the NHS administered revolving loan fund established to meet the needs of unbankable NHS clients and to stimulate improvements which will promote neighborhood confidence. NHS programs coordinate their work with local government housing inspections which are aimed at achieving voluntary compliance with generally accepted health and safety standards.

Each NHS concentrates on improving the quality of life for neighborhood residents. They are not merely lending programs. NHSs secure public and private resources for capital improvements and improving vacant dwelling units, commercial and multi-family structures, etc. The board of directors continuously evaluates NHS progress toward stabilizing the neighborhoods and may add new program components or expand services to additional areas.

The role of the Neighborhood Reinvestment Corporation in relation to NHSs is to develop the partnerships which form their heart, and to provide training, technical services, and assistance in implementing revitalization mechanisms and strategies.

Neighborhood Housing Services programs are now serving 182 neighborhoods in 132 cities throughout the United States. Development is underway on ten neighborhood programs in additional cities, and existing NHS programs are being given assistance in expanding to a further ten neighborhoods. We are particularly encouraged that in two dozen of these 182 neighborhoods, the NHS' primary goals have been accomplished and work is underway to establish ways of providing residual services which will help keep these neighborhoods up to a good standard of continuing maintenance, and to move the main thrust of the program into additional (usually more difficult) neighborhoods.

As a result of Neighborhood Reinvestment's research and development efforts, which begin with the identification of promising Neighborhood Preservation Projects, over 40 neighborhood preservation mechanisms and strategies have been instituted in communities throughout the United States. An additional 30 such complementary programs are in development. Three types of complementary programs are particularly worthy of note: the Apartment Improvement Program, the Owner Built Housing program and the Mutual Housing Association demonstration.

APARTMENT IMPROVEMENT PROGRAM

The Apartment Improvement Program is based upon a partnership of property owners and managers, tenants, financial institutions, and the city. The objective of each AIP is to revitalize neighborhoods for the benefit of current residents with particular emphasis on privately-owned apartment buildings. Through the use of a computerized Real Estate Investment Analysis Model, a financial analysis of the current and projected operations of each selected building is studied. An individually tailored improvement plan is developed for each building, including such activities as tenant participation, contemporary tax assessment reviews, repair and modernization, and increased investment or restructured mortgages to improve the economic viability of the buildings and to finance improvements. Developed in Yonkers, New York, the Apartment Improvement Program in its first 36 months was able to "turn around" sixty-five apartment buildings containing 3,500 units. The Apartment Improvement Program is now operating in 15 communities and additional programs are in development in eight communities. After having been considerably slowed during the past two years because of high interest rates, the Apartment Improvement Program is developing increased momentum with many rehabilitation packages becoming feasible at today's rates.

In FY 1982, AIP programs secured financing for 1,843 units totaling $15,400,000. In the first three months of FY 1983, financing commitments total $17,000,000 for 1,473 units.

OWNER BUILT HOUSING

The Owner Built Housing program addresses the need for affordable, quality housing for moderate income families. Based on a rural self-help model, this new program enlarges homeownership opportunity in NHS neighborhoods by enabling families collectively to build their own homes, with supervision, coordination, and technical assistance provided by the NHS. The initial demonstration project in the NHS neighborhood in Oakland, California was developed in 1980. It consisted of 14 families who invested 40 hours of work per week per family for a period of nearly a year. This investment of energy has enabled each family to take title to a conventionally-financed home with an estimated market value of over $85,000 by assuming a $43,000 mortgage.

The completion of ten units of Owner Built Housing in Hartford, Connecticut this month demonstrated that this construction method is feasible for two-story homes constructed with basements, and that with careful timing the activity can be carried out in climatic zones subject to severe winter weather. Encouraged by this, we have undertaken an Owner Built development in Anchorage, Alaska among five programs to get underway during Fiscal Year 1983.

MUTUAL HOUSING ASSOCIATION

In the Housing Act of 1980, we were encouraged to undertake a national demonstration of Mutual Housing Associations. Although no additional funding was provided for this, we have been able to do the initial organizational work for a Mutual Housing Association in Baltimore, Maryland, and are in discussion with several communities regarding additional demonstration sites. Based upon a highly effective Western European model, the Mutual Housing Association demonstration is designed to create prototypes of publicly accountable, competent, private nonprofit organizations committed to continued annual production of new and rehabilitated housing at costs affordable to families and individuals of below-median income typical of NHS neighborhoods.

The Mutual Housing Association does not provide ownership -- it is not a condominium or co-op -- it is "a step up from rental." It provides occupants with a voice in management, the opportunity for lifetime occupancy, and the potential for occupancy by future generations. They pay a share of the cost through a one-time membership fee (which earns nominal interest and is returnable), but have no equity interest.

The Mutual Housing Association demonstration also includes a model system of financing. It is designed to test a flexible, non-bureaucratic, cost-effective way for the production, maintenance and management of housing for lower income families. The financing mechanism is based on a front-end capital grant and membership fees combined with a small conventional mortgage. The rent calculation for each complex of homes includes a mutual capital charge which provides a source of capital for future development and provision for major replacement and modernization needs. Since the ownership vests in the association rather than the occupants, refinancing provides a further source of self-generated capital to the association.

The advantages of the capital grant system include: 1) flexibility (as interest rates change, the proportion of grant to mortgage changes to maintain a given rent level); 2) a one-time direct subsidy that is certain and does not inflate; and 3) a congruency of goals of developer, consumer and grantor.

The advantages of the tenure and governance system include neighborhood input into the level of maintenance, a balance between occupant interest and community interest in management decisions and, perhaps most important, a congruence of interest between "landlord" and "tenant" (the lack of this congruence has been perhaps the most glaring failure in America's past assisted housing efforts).

The organizational development in Baltimore has gone splendidly. The NHS partnership provided initial leadership which has since been supplemented by a committed group of Mutual Housing Association members waiting to occupy units which have been planned. The Association has incorporated as a Maryland nonprofit corporation, and has elected a 25-member governing Board representing a carefully balanced partnership. The Board consists of nine resident members, four waiting members (pre-residents waiting to move into mutual homes), four neighborhood representatives, two city-wide at-large community representatives with housing interests, four financial community and business representatives and two City government representatives.

We undertook to raise the funding for the Baltimore capital grants from foundations, and have encountered very slow going on this. I have been raising money from foundations for the past 25 years and I have never seen them stretched as thin as they are today, attempting to meet social needs. The concept of Mutual Housing is interesting to them and many have said they would be willing to participate in funding in a demonstration in their own communities, but only a very few have expressed interest in the Baltimore pilot. We are handicapped in this as compared to attracting private funds to Neighborhood Housing Services and complementary programs, since we are unable to provide a challenge grant or match to local funding.

In any case, the Baltimore Mutual Housing Association is beginning work on the first eight units this spring with the assistance of the City of Baltimore, the State of Maryland, and Neighborhood Reinvestment. During the summer, an additional eight units are planned with State of Maryland and foundation assistance. Our ability to begin one or more additional demonstrations and the ability of the Mutual Housing Association of Baltimore to build out the planned 120 units in Baltimore depends upon the availability of governmental and foundation resources.

PRIVATE SECTOR FUNDING

Fund raising has been a significant challenge for NHS programs during the past year. It is a challenge which has been met, however, and NHS programs have remained strong and viable organizations during very difficult economic conditions. We have undertaken to assist NHSs in several ways in meeting the critical fund raising needs. We have provided grants to Neighborhood Housing Services of America for the following kinds of financial development work:

1. Local fund raising assessments to determine the potential for NHS fund raising and as preliminary information necessary to design effective fund raising approaches and training.

2. Fund raising training seminars for NHS and Neighborhood Reinvestment staff.

3. Fund raising counseling to NHS programs toward individual fund raising goals.

4. Hands-on management of local, regional and state-wide NHS fund raising campaigns.

5. Application to The Advertising Council, Inc. for a business press campaign to familiarize corporate America with NHS.

6. Securing below-market social investment commitments to purchase NHSA Notes for the NHS secondary market.

7. Preparation for a corporate campaign to raise the contribution dollars which will be needed to fund the difference between the interest rate on NHS loans and the below-market social investment rate on the NHSA Notes for the NHS secondary market, plus funds to continue the local NHS fund raising assistance.

With the aide of the training and materials provided by NHSA, Neighborhood Reinvestment's staff has been successful in counseling many NHS programs in expanding their base of operating budget support to include more corporate contributors and to offset reduced thrift institution support. In addition to this, NHSA has provided direct assistance to a number of NHS programs by managing fund raising campaigns to support the local operating budgets and has achieved successful results. (Over 400 corporations are now supporting NHS operating budgets.) Considerable progress has been made in the development of NHSA's capacity to keep pace with NHS secondary market needs with a primary reliance on private, rather than Neighborhood Reinvestment, resources.

Successful application to The Advertising Council, Inc. for a national public service advertising campaign promises to create a climate for continuing achievement of NHS private sector support goals in Fiscal Year 1983 and beyond.

FISCAL OUTLOOK

In Fiscal Year 1982, and thus far in Fiscal Year 1983, Neighborhood Reinvestment shifted field staff efforts from new program development into a greater emphasis on providing assistance to NHSs in coping with economic challenges. We feel that the appropriate level of resources is now being applied to these technical services and that where possible, new program development should now begin to be re-emphasized.

A small increase in programmatic goals for FY 1983 has been approved by the Corporation's Board of Directors, based on the carry forward of funds from FY 1982. This will increase goals from 13 NHS starts to 15, from four Problem Properties Strategies starts to seven, from four Owner Built Housing starts to five, and from four Apartment Improvement Program starts to five.

Our request in FY 1984 for $15,512,000 is the same amount that was appropriated in FY 1983. In our All Sources Budget, however, we project a reduction of $1.8 million. This results from reductions in non-appropriated resources, including interest earnings, the carry forward from FY 1982 to FY 1983, local receipts related to NHS development, and support from the entities represented on our Board of Directors.

As you know, the Federal Home Loan Banks found it necessary to reduce their support for the "agency" portion of our budget from the requested $1.6 million to $409,000. Other agencies on our Board contributed funds to partially offset this 1983 shortfall as follows: Federal Reserve Board, $400,000; FDIC, $200,000; Comptroller of the Currency, $200,000. The Board of Directors expressed their intention that this support should be a one-time transitional funding and that our Fiscal Year 1984 submission request Federal funding to cover these expenses beginning in Fiscal Year 1984. The Office of Management and Budget, however, was not able to recommend additional funding to cover this shortfall. The significance of this reduction is evident in the elimination of 28 full-time equivalent staff positions, or twelve and a half percent of our staff in FY 1984.

In closing, I am pleased to now take your questions on our budget request as detailed in our previously submitted budget justification.

SUBMITTED QUESTIONS

Senator GARN. I have an additional 23 pages of questions for the record. If all of you are not famished working through the lunch hour, I am. I have been in hearings since nine o'clock. So unless you have anything else to say, we are happy to have had you here today, and wish you continued good success in your work.

Mr. WHITESIDE. Thank you very much.

[The following questions were not asked at the hearing but were submitted for response for the record:]

QUESTIONS SUBMITTED BY SENATOR GARN

ENERGY CONSERVATION

Question: You have been working with several NHSs across the country in developing comprehensive and effective energy conservation programs to combat rising fuel and utility costs. Last year, I noted that as a result of this you were awarded an energy conservation grant by the Ford Foundation and I asked you about your activities in the energy conservation area.

Could you bring us up-to-date on the use of the $230,000 grant and the estimated fuel savings you expect to achieve?

Answer: We are preparing the final report for the Ford Foundation which should be completed by the end of May. The report covers the five programs where Ford Foundation dollars were used: NHSs in Chelsea, Massachusetts; Denver, Colorado; Rochester, New York; an Apartment Improvement Program in New York City (Bronx-Pelham Parkway); and the Neighborhood Reinvestment Training Department for production of a publication for NHSs called "Weathervane" which describes effective approaches to energy conservation in housing rehabilitation.

We have observed initial savings in fuel dollars from the Chelsea and Denver projects (the first programs to report information), where there has been a 15% reduction in consumption.

However, we only have results from one winter season; it will take two seasons to really know how much the fuel savings were.

There is a great deal of demand throughout the NHS network for technical assistance and small grants to enable the programs to get started in the energy area and in FY 1984 we are budgeted to provide training in this area to 60 NHSs. Energy conservation is emerging as an effective marketing tool for NHSs.

APARTMENT IMPROVEMENT PROGRAM

Question: In last year's budget justification, you indicate that economic climate had impacted the rehabilitation activity of the Apartment Improvement Program. However, you went on to say that in the Bronx, an area participating in this program, a $7.7 million private financial package had been put together which when finalized will rehabilitate a 713-unit apartment complex.

From what financial sources do you expect to put together this package? What is the current status of this program?

Answer: The financing will come from either the Community Preservation Corporation, a consortium of approximately 39 commerical and savings institutions in the New York City area, or the Thrift Service Corporation, a cooperative effort of savings and loan associations in New York State.

Actual work will start once the financing package is committed. We anticipate work will begin this summer.

RESOURCES NEEDED TO MAINTAIN FY 83 LEVEL SERVICES

Question: What resources would you require to maintain your FY 83 level of services during FY 84?

Answer: Approximately $2.5 million. This would cover a 4% overall increase over FY 83 costs and replace the shortfall in non-appropriated resources.

REHAB/RENTAL HOUSING

Question: The Neighborhood Rental Services program allows an NHS or other neighborhood nonprofit organizations to purchase and rehabilitate vacant buildings and operate these buildings as rental housing. These buildings are operated by the neighborhood and provide for the needs of lower to moderate income renters.

What neighborhoods are participating in this program?

What is your impression as to the merits of this activity?

Answer: The NHSs in Baltimore, Maryland and Ithaca, New York are participating in this program. The Neighborhood Rental Services approach has proven effective in solving several issues which affect many NHS neighborhoods. Where there are blocks that have such a low percentage of homeownership and where local confidence is very low, the ability to purchase, rehab and responsibly rent properties has proven a great boon to both the neighborhood and the renters. In Baltimore, the tenants have been lower income individuals and families who could not or have not wanted to own. The rental service has enabled them to remain within the neighborhood.

In Ithaca, the approach has additionally been used on structures too large for homeownership, but too small for responsible investor management. By tackling these structures, the NHS has turned eyesores into points of confidence and provided low income families stable living environments. In both cities, the waiting lists for units far exceed their capacity to meet demand. In Baltimore, the waiting list is equivalent to 16 times the number of units they have available.

In both cities, this program has utilized a variety of resources -- foundations and private and public loans, grants and subsidies, including Section 312 loans, Section 8, and Community Development Block Grant funds.

In the past two years, there has been a significantly reduced amount of funding through Section 312 loans and Section 8. The Neighborhood Rental Services approach seems best suited to a relatively small scale operation. There also could be disadvantages to having NHS be seen as a neighborhood "landlord." The Mutual Housing Association demonstration shows promise as the preferred model where greater scale is desired.

NEIGHBORHOOD BUSINESS CENTERS

Question: The Neighborhood Business Center program has been designed to assure the viability of commercial districts by strengthening small businesses, improving the physical environment of the area and providing additional goods, services and employment for the community.

Last year, you indicated that the program will be started in two additional cities during FY 83.

Have these two cities been selected yet and what are your FY 83 and FY 84 plans for this program?

Answer: Neighborhood Reinvestment has developed programs in Atlanta, Georgia and Bridgeport, Connecticut, and is developing programs in Kansas City, Missouri and Niagara Falls, New York, both of which are nearing completion. Sites for the two FY 1983 starts have not yet been selected, however, assessments have been conducted and a decision will be made in the near future. One start is projected for FY 1984; the demand and need are much greater than we are able to meet within our budget resources.

In both Bridgeport and Atlanta, the local merchants have organized themselves into an association which provides a variety of services such as paint promotions, loan packaging, common advertising and special events. These associations operate as a division of the NHS and thus benefit from close ties with adjacent residential areas as well as maintaining their own programmatic thrust. In Bridgeport, nearly $1 million in reinvestment activity has occurred. In Atlanta, the merchants have focused on attracting new businesses to their area to provide a better mix of goods and services. In the last year, 14 new businesses have been attracted to the target area.

We have found that with a combination of a careful developmental process and on-the-street provision of technical services, once endangered commercial strips have become assets for their communities.

At this early stage, it appears as if Niagara Falls and Kansas City will yield similar positive results.

UNOBLIGATED BALANCES

Question: What do you expect your FY 83 unobligated balances to be?

Answer: The Corporation can expect an unobligated balance of $300,000 to $500,000 which represents 2% to 3% of its budget. This is about as close as we can get without risking going over budget. We would always prefer to err on the low side.

MUTUAL HOUSING ASSOCIATION -TENANT INCOMES

Question: In your Mutual Housing Association demonstration program, the rent calculation includes a mutual capital charge which provides a source for capital for future development and a provision for major replacement and modernization needs.

Based on your experience to date, in Baltimore, what is your estimate of the income ranges of the individuals on the waiting list -- that is, as a percent of median income in the area?

What do you anticipate the rent contribution to be as a percent of the members' income -- that is, 30%, 35%, etc.?

Answer: The median family income of the 27 families who are "pre-resident" members of the Mutual Housing Association is $19,850. This is 104% of the median family income in the census tract in which the Mutual Housing Association units are being constructed. We believe that this is an unusual group of Govans tenants, in that they have committed themselves to an ideal and are able to enter into a lengthy wait for housing. Once the Mutual Housing Association concept is tangible, we anticipate that families more typical of Govans' renters (60% - 80% of the census tract median) will be applying for membership. Rent contribution (including utilities) as a percent of members' income is 22% in this initial group.

APARTMENT IMPROVEMENT PROGRAM

Question: You note in your opening statement that the Apartment Improvement Program is based upon a partnership of property owners and managers, tenants, and financial institutions in the city. Does the concept involve, or can it involve, equity on the part of tenants, and, if so, how would this work?

Answer: The concept can involve equity on the part of tenants, however, given the fact that we're working in lower income areas, the ability of the tenants to participate in an equity position has been limited.

PUBLIC SERVICE ADVERTISING

Question: In your opening statement, you note that the Corporation has made a successful application to The Advertising Council, Inc. for a national public service advertising campaign.

Could you please describe the objectives of this campaign and its scope?

Answer: In January, 1983, a significant breakthtough in creating a proper climate for the fund raising campaign came with the selection of Neighborhood Housing Services by The Advertising Council, Inc. for a public service campaign. The business press campaign will be particularly geared to be helpful in local fund raising efforts as it will focus on familiarizing corporate America with NHS. More than 3,500 business press outlets will be used to achieve this enormous educational job. We are hopeful that creative work on this campaign will be completed within the next three months and the campaign launched by September of this year. This will help create the name recognition and national significance necessary to enlist national leadership required for a successful fund raising campaign.

CONTRACTS WITH NEIGHBORHOOD HOUSING SERVICES OF AMERICA

Question: Could you please provide for the record a description of the services the Corporation is expected to contract from Neighborhood Housing Services of America?

Answer: In FY 1984, Neighborhood Reinvestment expects to contract with Neighborhood Housing Services of America to provide services in the following areas:

- secondary market operations;
- financial development assistance for NHS programs and the national fund raising campaign; and
- educational development project to increase the pool of qualified staff for NHS programs.

A complete description of current Neighborhood Housing Services of America activities is provided in Appendix H of the FY 1984 budget justification.

SUB-LETTING EXISTING OFFICE SPACE

Question: On page 21 of your budget justification, you state that certain savings and rental costs would be achieved by sub-letting existing office space in locations where staffing reductions would make this possible.

What is your current estimate as to the amount of "savings" that would be achieved through sub-letting space as a result of staff reductions?

Answer: While we occupied space in the Federal Home Loan Bank Board, it was necessary to rent a small additional space for staff in Washington. With our move to 1850 K Street, we subleased the additional space for $18,480 per year, which helped reduce this obligation. Annually, as a result of changes in program activity, we have offices that become either too small or large for our current needs. It is our policy to sublease or take whatever steps are the most cost effective to reduce excess office space obligations. Overall, we do not expect that major savings would be achieved.

OMB REQUEST

Question: Please prepare for the record a comparison of your OMB request and current budget submission, using the same level of detail as appears on pages 31 and 32 of your budget justification.

Answer: Table A displays our FY 1984 request to OMB which was prepared in mid-summer 1982 for submission September 1, 1982. At that time our FY 1983 goals were lower (Table B) than those submitted in our budget justification. The intervening months had allowed for a revision upwards in goals due to a number of factors including cost savings and use of carry forward funds.

Table A
NEIGHBORHOOD REINVESTMENT CORPORATION
SUMMARY OF MAJOR FY 1982-1984 GOALS AND FUNDING REQUEST TO OFFICE OF MANAGEMENT & BUDGET (Sept. 1982)

	1982	1983	1984			
			Minimum	Current	Intermediate	Enhanced
RESOURCE REQUIREMENTS						
Budget Authority ($000s)	$13,872	$15,512	$16,398	$18,042	$20,557	$22,257
Other Income ($000s)	5,013	2,428	1,185	1,356	1,575	1,750
Total ($000s)	18,885	17,940	17,583	19,398	22,132	24,007
Positions - FTEs	232	225	221	226	234	240
NEIGHBORHOOD HOUSING SERVICES - ESTABLISHING NEW, SUPPLEMENTING EXISTING, AND PROVIDING TECHNICAL SERVICES						
NHS Development (New & Expansion) Starts	17	13	10	12	16	20
Continued Development from Prior Year	28	26	15	15	15	15
Programmatic Supplements - Pilot Replications						
Problem Properties Strategies Starts	4	4	4	4	6	9
Continued Developments from Prior Year	5	9	5	5	5	5
Insurance Full Partnership Starts	4	4	3	4	4	4
Continued Developments from Prior Year	1	3	2	2	2	2
Owner-Built Housing Starts	4	4	2	4	7	8
Continued Developments from Prior Year	1	6	4	4	4	4
Commercial Revitalization Starts	2	2	0	0	1	1
Continued Developments from Prior Year	3	3	1	1	1	1
Energy Conservation Starts	2	2	1	1	2	3
Continued Developments from Prior Year	1	0	1	1	1	1
Training and Technical Services						
Ongoing Training and Technical Services (# of Programs)	173	198	211	211	211	211
Program Reviews and Evaluations (# of Reviews)	80	100	150	150	150	150
Secondary Market Capitalization Grant ($000s)	600	550	500	550	650	700
Training New Directors and Construction Specialists (# of Participants)	130	130	*	*	*	*

Table A (continued)
NEIGHBORHOOD REINVESTMENT CORPORATION
SUMMARY OF MAJOR FY 1982-1984 GOALS AND FUNDING REQUEST TO OFFICE OF MANAGEMENT & BUDGET (Sept. 1982)

	1982	1983	1984			
			Minimum	Current	Intermediate	Enhanced
Local Program Staff and Partnership Training/Conferences and Workshops (# of Participants)	1,700	2,140	*	*	*	*
APARTMENT IMPROVEMENT PROGRAM						
AIP Development Starts	4	4	2	4	6	7
Continued Developments from Prior Year	6	9	4	4	4	4
AIP Training and Technical Services (# of Programs)	13	19	23	23	23	23
RESEARCH AND PILOT REPLICATION						
Neighborhood Preservation Projects - New	36	27	20	22	24	24
Continued from Prior Year	15	40	30	30	30	30
Mutual Housing Association Development Starts	0	1	**	**	**	**
Continued Developments from Prior Year	1	1	2	2	2	2

*Planned, but not included in OMB submission.

**Included in the OMB submission as an additional funding request of $3 million, $6 million and $9 million for the current, intermediate and enhanced level. This would fund the following:

- At the current level, developmental, start-up and capital grant costs would be funded for 60-70 Mutual Housing Association units.
- At the intermediate level, 120-140 units and the necessary organizational development could be funded -- at two additional sites.
- At the enhanced level, an optimal three site expansion of the demonstration could take place, producing 180-210 Mutual Housing Association units.

Table B
NEIGHBORHOOD REINVESTMENT CORPORATION
SUMMARY OF MAJOR FY 1983-1984 GOALS AND FUNDING REQUEST

RESOURCE REQUIREMENTS	FY 1983 OMB (SEPT 1982)	FY 1983*	FY 1984 BUDGET JUSTIFICATION (FEB 1983)
Budget Authority ($000s)	$15,512	$15,512	$15,512
Other Income ($000s)	2,428	2,915	1,137
Total ($000s)	17,940	18,427	16,649
Positions - FTEs	225	225	197
NEIGHBORHOOD HOUSING SERVICES - ESTABLISHING NEW, SUPPLEMENTING EXISTING, AND PROVIDING TECHNICAL SERVICES			
NHS Development (New & Expansion) Starts	13	15	15
Continued Development from Prior Year	26	26	15
Programmatic Supplements - Pilot Replications			
Problem Properties Strategies Starts	4	7	5
Continued Developments from Prior Year	9	9	5
Insurance Full Partnership Starts	4	4	4
Continued Developments from Prior Year	3	3	2
Owner-Built Housing Starts	4	5	3
Continued Developments from Prior Year	6	6	4
Commercial Revitalization Starts	2	2	1
Continued Developments from Prior Year	3	3	1
Energy Conservation Starts	2	2	1
Continued Developments from Prior Year	0	0	1
Training and Technical Services			
Ongoing Training and Technical Services (# of Programs)	198	198	211
Program Reviews and Evaluations (# of Reviews)	100	100	125
Secondary Market Capitalization Grant ($000s)	550	550	490
Training New Directors and Construction Specialists (# of Participants)	130	130	130
Local Program Staff and Partnership Training/Conferences and Workshops (# of Participants)	2,140	2,140	2,300
APARTMENT IMPROVEMENT PROGRAM			
AIP Development Starts	4	5	3
Continued Developments from Prior Year	9	9	4
AIP Training and Technical Services (# of Programs)	19	19	23
RESEARCH AND PILOT REPLICATION			
Neighborhood Preservation Projects - New	36	27	12
Continued from Prior Year	15	40	30
Mutual Housing Association Development Starts	0	1	1
Continued Developments from Prior Year	1	1	2

*As approved by Neighborhood Reinvestment Board of Directors

Senator Garn—Continued

INTEREST INCOME

Question: In your budget justification, you indicate that your interest earnings are expected to be $857,000 during FY 1984.

Could you please provide, for the record, a description of how this interest income estimate was arrived at and why it is less that the FY 1983 and FY 1982 amounts?

Answer: The calculation of projected FY 1984 interest earnings is shown on the table below. The reduction from 1983 and 1982 levels is due to assumed declining interest rates and reduced balances of obligated but undisbursed grants.

NEIGHBORHOOD REINVESTMENT CORPORATION
Projected FY 1984 Interest Earnings
(Thousands of Dollars)

	Operating Balance Start of Month	Cash Req'd	Average Balance Invested	Projected* Earnings
October	$ 3,000	$(1,387)	$ 2,306	$ 15
November	1,628	(1,387)	934	6
December	15,759	(1,387)	15,065	101
January	14,466	(1,387)	13,773	92
February	13,166	(1,387)	12,473	83
March	11,859	(1,387)	11,165	75
April	10,542	(1,387)	9,849	66
May	9,218	(1,387)	8,524	57
June	7,885	(1,387)	7,191	48
July	6,543	(1,387)	5,850	39
August	5,193	(1,387)	4,500	30
September	3,835	(1,387)	3,141	21
	Total Interest Earned on Operating Fund Balance			$633
	Interest Earned on Obligated but Undisbursed Grant Balance ($2,800 x .08%)			$224
	Total Interest Earnings			$857

*Equal to average balance invested multiplied by the monthly periodic interest rate (.08%/12 = .0067%).

BALTIMORE MUTUAL HOUSING ASSOCIATION

Question: On page 12 of your budget justification, you state that the Baltimore Mutual Housing Association will have begun construction on phase one of the eventual 150 units of two-story brick townhouses. On page 8 of your opening statement, you state that the Mutual Housing Association of Baltimore consists of 120 units.

Could you please explain this discrepancy?

Answer: The earlier figure was approximate; a portion of the property has been split off and sold to a developer to allow for construction of 40 units of for-sale subsidized housing as part of an Urban Development Action Grant project, leaving a remaining 120 lots for construction of Mutual Housing Association units.

EVALUATION OF NHS PARTNERSHIPS

Question: On page 11 of your justification, you note that approximately 100 NHS partnerships will have been evaluated through onsite reviews.

Could you please provide for the record the major findings of these reviews, the major issues yet to be resolved, and what efforts the Corporation has underway to address these issues?

Answer: In conducting a program review, Neighborhood Reinvestment staff assist the NHS partnership staff in a self-evaluative process that provides an opportunity for the NHS to evaluate its past, current and projected activities in serving the NHS neighborhood. Neighborhood Reinvestment staff members meet with partnership groups, board and staff members, tour the neighborhood, observe field work and provide a forum for discussing the following program areas:

1. Board organization and operations;
2. Financial development;
3. Community and public relations;
4. Internal management;
5. Program planning; and
6. Program services.

Neighborhood Reinvestment staff receive and review the NHS financial audit, activity reports, financial statement and general program materials. These materials assist us in understanding the thrust of individual programs, and in pinpointing general patterns and trends.

Each NHS is an autonomous, local corporation, having a unique composition of board/staff members who serve a unique neighborhood. NHS programs nationally have a wide variety of diverse neighborhoods. They have different strengths and weaknesses and since no two programs are alike, each NHS has somewhat different successes and problems. As such, the self-evaluative process requires Neighborhood Reinvestment staff to have a high degree of technical expertise, sensitivity and flexibility in providing assistance and recommendations without creating dependence.

Through the review process, we are able to assist programs in identifying problem areas, developing strategies to strengthen results, and implementing action toward achieving local goals. Recent findings include the following:

1. NHS programs are becoming increasingly sophisticated in internal management and technical operations;

2. NHSs in the main are providing quality rehab and financial assistance;

3. Fund raising training provided by Neighborhood Reinvestment and Neighborhood Housing Services of America has enhanced local program confidence in planning, implementing and managing their local fund raising campaigns;

4. There is a need in many programs to strengthen resident participation and involvement to ensure ongoing resident leadership; and

5. There is a need to focus locally on specific neighborhood goals and impact measures to: 1) be able to achieve primary neighborhood impact goals; 2) assist the partnership in recognizing the accomplishments; 3) move toward a residual services level when primary goals are met; and 4) participate in moving the main thrust of the program to another neighborhood.

NEIGHBORHOOD HOUSING SERVICES FUNDING LEVERAGE

Question: Through FY 1983, the Neighborhood Housing Services program will have raised approximately $67.7 million for operations. In your justification, you estimate that the program will have generated over $1.7 billion in total reinvestment. This amounts to a ratio of approximately 25 investment dollars for each Neighborhood Housing Services dollar.

What is your estimate as to the "leverage" that you can now exercise given the current economic climate?

What is the Corporation doing in order to increase the involvement of the private sector, foundations and local governments in the activities of Neighborhood Housing Services?

Answer: These estimates are drawn from NHS records and a survey of the investments made by homeowners in 20 NHS neighborhoods, conducted in 1980. We assume the ratio of total reinvestment to operating funds remains about the same, based upon NHS records of housing investments for which they are directly responsible. We are aware of the need for a more current sampling and are exploring methods for getting the results without the full scale costs of a major study.

Neighborhood Housing Services programs have remained strong and viable organizations during the very difficult economic conditions of the past three years. While some NHSs have lost contributors, most notably savings and loan institutions, all have risen to the challenge of increasing their base of support. Neighborhood Reinvestment and Neighborhood Housing Services of America have worked actively to promote a broader base of support for NHS programs. Included in these efforts are:

1. A conceptual redirection of the NHS image as more than a "rehab program" to facilitate a broader base of support;

2. Intensive fund raising training throughout the NHS network;

3. Direct fund raising counseling of well over a hundred NHSs and hands-on management of seven campaigns; and

4. Preliminary work on a national fund raising campaign to support the secondary market.

The conceptual strengthening of NHSs' image has been facilitated by the growing interest on the part of property-casualty insurance companies as a vehicle to demonstrate their willingness to play a growing constructive role in urban neighborhoods. Today, over 100 insurance companies are providing leadership and financial support to 49 NHS programs. Eight NHS programs are benefiting from Insurance Industry Full Partnerships which also include a mechanism to provide standard property-casualty insurance services to 27 neighborhoods. The Equitable Life Assurance Society of the United States, The Prudential Insurance Company of America, The Wausau Insurance Company and Aetna Life & Casualty have also made significant commitments to participate in NHSA's secondary market by purchasing notes backed by NHS revolving loans.

Increased corporate support has also been achieved, with over 400 corporations now contributing to NHS programs.

OWNER BUILT HOUSING

Question: In your opening statement, you note that the completion of 10 units of Owner Built Housing in Hartford, Connecticut demonstrates that this construction method is feasible for two-story homes and that the activity can be carried out in climatic zones subject to severe winter weathers.

What was the estimated market value of these homes and the mortgage amount assumed by the owners?

Answer: The 10 owner builders in Hartford each assumed a $43,000 mortgage on a house that would have cost $63,000 to build by conventional methods. The estimated market value of each of these homes is $70,000. Additionally, the Hartford NHS is doing 42 homes in a second phase.

Question: You note that the Corporation has undertaken an owner built development in Anchorage, Alaska.

What is the current status of this project? How many homes are involved and when do you expect them to be ready for occupancy?

Answer: In Anchorage, construction will begin on 12 units when the ground thaws in May. The houses should be ready for occupancy within 10 months.

Question: In what other areas do you expect to start owner built development in FY 1983 and FY 1984?

Answer: In FY 1983, we also expect to assist in Owner Built developments in Nashville, Tennessee; Durham, North Carolina; Clackamas County, Oregon; Pueblo, Colorado; Minneapolis, Minnesota; Salt Lake City, Utah; Santa Ana, California; and Chelsea, Massachusetts. By this July over 150 owner built homes will be under construction. In FY 1984, we have budgeted for three programs, although we project demand to be several times that amount.

POSSIBLE NUMBER OF TARGET NEIGHBORHOODS

Question: In your budget justification, you estimate that several hundred neighborhoods throughout the nation are at a point where intervention by a local partnership, equipped with NHS tools, "can tip the balance from decline to revitalization."

On what basis did you arrive at this "estimate" of several hundred neighborhoods?

Answer: This estimate was based on an analysis of census data. Typically, NHS neighborhoods contain a housing stock of 500 to 2,000 units which show evidence of deterioration and lack of maintenance; have an inadequate degree of mortgage and home improvement activities; have a substantial degree of homeownership; and have an income mix averaging 83% of city-wide median incomes. The impact study, Neighborhood Partnerships in Action, conducted at the request of OMB in 1981, estimated that between 2,000 and 10,000 inner-city neighborhoods have economic and physical characteristics similar to NHS neighborhoods. The wide range is largely due to the difficulty in analyzing so much data without a more extensive study.

The selection of neighborhoods appropriate for Neighborhood Housing Services programs depends, however, on both the physical characteristics of a neighborhood, the interest and capacity of a neighborhood group to operate the program, and local definitions of what constitutes a neighborhood. An assessment of the local capability to organize and fund an NHS is made by senior staff prior to any commitment by Neighborhood Reinvestment to develop a program. The observation that "several hundred" neighborhoods would be appropriate for NHS was a conservative estimate based on this study, and our observations of the readiness of large numbers of neighborhoods to benefit from NHS intervention.

LOCAL GOVERNMENT CONTRIBUTION

Question: Your budget justification indicates that in FY 1981, you received $2,036,557 from local governments in conjunction with your Neighborhood Housing Services operating budget. This represented 21.2% of that budget. In FY 1982, you received $2,992,864 or 22.1% from local governments.

What is your estimate for FY 1983 and for FY 1984?

To what extent has the recent economic downturn affected these local contributions?

Answer: The percentage of NHS operating dollars contributed to local NHSs by state and local governments has remained fairly stable for the past five years, and we see that trend continuing. The recession has not had any significant effect on local government contributions.

In 1982, approximately 25% of the NHS programs received some operating support from local or state governments. Three programs, called Neighborhood Conservation Services programs, were organized as city-supported programs; the others receive funding to support additional neighborhood programs organized at the request of the locality, to fund special projects, or to augment funding in smaller cities where the base of private contributions is not large enough to support the average $85,000 operating budget.

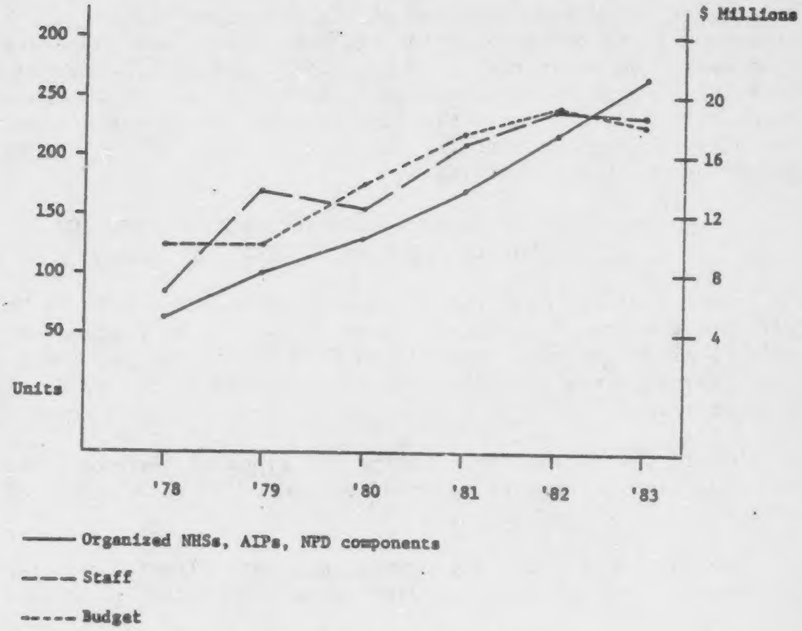
IMPACT OF STAFF DECREASES

Question: Your FY 1984 budget request anticipates a reduction of 28 people or 12% in your staffing. In discussing the impact of this staff decrease, your budget justification states, " As our staff's experience base has broadened in providing technical services, their proficiency has also increased. We are providing more services to a larger number of programs, and anticipate doing so with a smaller staff and a reduced All Sources Budget in FY 1984. This continuing increase in productivity is a major achievement."

You mention that this increase in "staff productivity" has resulted in a modest increase in the Corporation's goals during FY 1983.

To what do you attribute this, rather recent, increase in staff productivity?

Answer: As the number of local programs has grown and their average age has increased, their ability to successfully revitalize and stabilize neighborhoods has also increased. Part of this growing effectiveness has been due to our own ability to provide them with a wider array of sophisticated program tools and technical services. Although our workload has grown at a faster pace than our budget resources, our staff's base of experience through assignments, training and tenure has also continued to grow, increasing our productivity and proficiency (as the following chart will demonstrate):



Question: I notice that in modifying your FY 1983 goals, it increased your NHS starts by two, your initial Problem Properties Strategies starts by three, your Owner Built Housing starts by one, and your Apartment Improvement starts by one.

Since you have spread your resources across a wide variety of programs, does this imply that each of these programs have a similar degree of impact, or does it just indicate your interest in "replicating" these programs in sufficient number to judge their efficacy?

Answer: Establishing program goals for any given year requires serious consideration of a number of factors. Foremost, of course, is our responsibility under the Neighborhood Reinvestment Corporation Act to establish and provide grants and technical services to Neighborhood Housing Services programs; to identify, evaluate and provide grants and technical assistance to promising Neighborhood Preservation Projects that demonstrate success, and, after creating reliable developmental processes, to assist in integrating these components with ongoing NHS programs through organizational assistance, grants and technical services; and to provide grants to Neighborhood Housing Services of America (NHSA) to support the secondary market for NHS loans and to contract with NHSA for services which it can perform more effectively or efficiently than the Corporation.

Based on these general objectives, we have sought to continue to strengthen and expand the work of the individual Neighborhood Housing Services already operating. These efforts show up as technical services and training, conferences and continued support of NHSA fund raising training and expansion of the secondary market. In balancing programmatic activities such as new NHS starts, new Apartment Improvement Program starts, an Owner Built component, or a Problem Properties Strategy, we consider such factors as the volume of local requests for particular activities, typical costs associated with the activity and our staffing capacity in light of the complexity and duration of the activities.

ALLOCATION OF FY 84 - RESOURCES BETWEEN NEW AND EXISTING NEIGHBORHOOD HOUSING SERVICES

Question: In describing the allocation of your FY 84 budget, you note that you intend to hold your new program development efforts close to those obtained in FY 83, with the funding reductions taken largely from technical services offered to the programs already in operation.

Could you please characterize the types of technical service reductions that are likely to occur during FY 84 as a result of this strategy?

To what extent has the current economic climate increased the requirement for technical service in your operating programs?

Did your report explicitly discuss the policy implications of this resource allocation strategy, and what were their conclusions?

I note that on page 4 of your budget justification you list as one of the missions of the Corporation, "provide ongoing training and technical services to local programs to insure their continuing effectiveness."

Answer: The ongoing training and technical services provided to NHS programs primarily consist of formal and on-site training programs for partnership and staff members, educational workshops and conferences and grants to Neighborhood Housing Services of America in support of the secondary market and NHS financial development campaign. Occasionally, more intensive assistance may be required to address a specific local program management or operational concern, but historically, with the exception of the last two years, these intensive efforts have been limited to a comparatively small number of programs.

Over the last two years, the economic climate and corresponding decline in thrift industry financial support necessitated a significant change in the level of intensive assistance provided. Specifically, corporate and foundation fund raising training and the provision of staff to directly assist with local program campaigns have been a major area of concentration. The early successes of the financial development program, the increased skills and experience in fund raising and the improving economy are making it possible for us to project a decline in our required level of effort in this area in FY 1984.

We project, by the time FY 1984 begins, that with a strengthened economy, increased local skill and expertise in fund raising and the increased experience of our staff, we will be able to reduce proportionately per NHS our technical services costs.

SUPPORT FROM OTHER FEDERAL AGENCIES

Question: In your opening statement, you note that the Board of Directors of the Corporation express their intent that the support from other agencies provided in FY 1983 should be viewed as transitional funding and that in the future all Federal-source funds should be appropriated through this Subcommittee.

What was the rationale for this Board decision?

Do you believe that any of the Federal agencies that provided funds in FY 1983 would do so again in FY 1984 if it were not for this Board policy?

Answer: From Neighborhood Reinvestment's inception, the Federal Home Loan Bank System has provided financial, leadership and in-kind support. In FY 1983, as their resources were under pressure, the Federal Home Loan Banks found it necessary to reduce their support, and asked the other agencies represented on the Corporation's Board to contribute to offset the shortfall. The Federal Reserve, the FDIC and the Comptroller of the Currency made substantial contributions towards offsetting the shortfall in Federal Home Loan Bank Board support.

At the time, the contributing agencies indicated that they would prefer not to apportion resources unless essential. (The Department of Housing and Urban Development, while not making any further general grants since their initial funding of the Urban Reinvestment Task Force, has for several years "set aside" a number of Section 8 units for use by NHS clients. The National Credit Union Administration has an annual budget only slightly larger than Neighborhood Reinvestment and felt that, given the size of their resources, they could not contribute.)

The Board's approach to FY 1984 was to ask OMB to increase the President's request for Federal funds to substitute for agency contributions, considering the agency support in FY 1983 as transitional assistance. There has been no Board decision to not accept agency contributions in FY 1984. I feel confident that the Board would accept such contributions as they have in the past. Decisions on whether to contribute, however, are individual agency matters.

REDUCTIONS IN GRANTS AND GRANT COMMITMENTS

Question: An analysis of the nine line items in your budget request shows that the largest percentage decrease, from the FY 83 level, will occur in "grants and grant commitments." This will amount to a 17.5% decrease, when only Federal funds are considered and a 26.4% decrease, considering all sources of funding.

Although I understand that most of the other categories (such as salaries and benefits) are "fixed," is there any way the Corporation could further reduce these other categories in order to mitigate the large decrease expected for grants and grant commitments?

Answer: For the most part, Neighborhood Reinvestment's largest grants are tied to new developments in NHS and NHS expansion, AIP,

Senator Garn—Continued

Owner Built Housing, Problem Properties, and commercial revitalization. The anticipated reductions of five new developments in these areas account for a substantial portion of the decrease projected in grants and grant commitments. Another significant reduction in this line is represented by a decreased grant to Neighborhood Housing Services of America. In FY 1983 Neighborhood Reinvestment granted funds to NHSA to develop three levels of fund raising assistance. Based on an anticipated improving economy, increased NHS experience in local fund raising and anticipated early results from the national fund raising campaign, the amount budgeted for this grant has been reduced.

As the number of programs continues to grow, maintaining the staffing and other costs associated with basic, ongoing training and technical services is required. The base of our staff's experience in providing these services has continued to broaden and proficiency has increased. We will be providing more services to larger numbers of programs, and anticipate doing so with a smaller staff to program ratio and a reduced All Sources budget.

BUDGET JUSTIFICATION

PREFACE

The preface to last year's budget justification stressed the impact of difficult economic times on Neighborhood Housing Services (NHS) programs, and the adaptations this had required in Neighborhood Reinvestment's services and activities. There was a substantial shift of field staff effort into technical services to operating programs, with heavy stress on assisting them expand the base of their private fund raising.

NHS programs have shown a remarkable resilience in this climate and have been satisfactorily coping with reduced resources and tackling increasing neighborhood needs. Neighborhood Reinvestment's technical services, along with the financial development work of Neighborhood Housing Services of America made a critical difference to NHS programs in coping with the threat of reduced contributions. The following table shows the growth and shift in sources of NHS operating budget support.

	1981	%	1982	%
Savings and Loans and Savings Banks	$3,206,449	33.35	$3,822,639	28.27
Commercial Banks	2,225,783	23.15	3,198,394	23.65
Insurance Companies	686,960	7.15	948,000	7.00
Credit Unions	28,140	.29	26,270	.19
Corporations, Utilities, and Other Private Sources	1,430,974	14.88	2,536,557	18.76
Local Government	2,036,557	21.18	2,992,864	22.13
TOTAL	$9,614,863	100.00	$13,524,724	100.00

As the table illustrates, contributions were increased in almost every category. The reduced proportion of thrift institution support was offset in the main by a growth in support by other corporations.

The redirection of Neighborhood Reinvestment's effort which helped NHS programs rise to the challenge was made largely at the cost of new program development. We believe we can now begin shifting some effort back in the direction of new program development.

Economies realized and anticipated during FY 1983, along with increasing staff productivity, and a carry forward of funds from FY 1982, have permitted a small increase in programmatic goals for FY 1983 to be proposed to the Corporation's Board of Directors. Goals increased from 13 NHS starts to 15, from four Problem Properties Strategies starts to seven, from four Owner-Built Housing starts to five, and from four Apartment Improvement Program starts to five.

The request for FY 1984 for $15,512,000, the same amount that was appropriated in FY 1983, shows a reduction of $1.8 million in non-appropriated funding. The significance of this reduction is evident in the elimination of 28 full-time equivalent staff positions, or twelve and a half percent of our staff. We project, however, that with a strengthening economy, because of strengthened NHS fund raising capacity, and the prospect of NHSA's secondary market being able to proceed on a more secure, privately funded base, FY 1984 new program development can be held close to the FY 1983 level, with the funding reductions taken largely in a further reduction of technical services to operating programs.

INTRODUCTION

General

The Neighborhood Reinvestment Corporation was created in 1978 by the Neighborhood Reinvestment Corporation Act,42 U.S.C. Sec.8101(Supp.1981), as amended by Act of Oct. 15, 1982, Pub L. No. 97-320, Sec.710,96 Stat.1544, (see Appendix A) to continue and expand the work of the Urban Reinvestment Task Force, which was a joint effort of five Federal financial supervisory agencies and the Department of Housing and Urban Development to promote reinvestment in neighborhoods. Section 606(a) of that law, as amended, states that:

> (1) The corporation shall continue the work of the Urban Reinvestment Task Force in establishing neighborhood housing services programs in neighborhoods throughout the United States, monitoring their progress, and providing them with grants and technical services ...
>
> (2) The corporation shall continue the work of the Urban Reinvestment Task Force in identifying, monitoring, evaluating, and providing grants and technical assistance to selected neighborhood preservation projects which show promise as mechanisms for reversing neighborhood decline and improving the quality of neighborhood life.
>
> (3) The corporation shall experimentally replicate neighborhood preservation projects which have demonstrated success, and, after creating reliable developmental processes, bring the new programs to neighborhoods throughout the United States which in the judgment of the corporation can benefit therefrom, by providing assistance in organizing programs, providing grants in partial support of program costs, and providing technical assistance to ongoing programs.
>
> (4) The corporation shall continue the work of the Urban Reinvestment Task Force in supporting Neighborhood Housing Services of America, a nonprofit corporation established to provide services to local neighborhood housing services programs, with support which may include technical assistance and grants to expand its national loan purchase pool and may contract with it for services which it can perform more efficiently or effectively than the corporation.

The Corporation's board of directors is composed of:

Richard T. Pratt, Chairman
Chairman
Federal Home Loan Bank Board

J. Charles Partee, Vice Chairman
Member, Board of Governors
Federal Reserve System

Samuel R. Pierce, Jr.
Secretary
U.S. Department of Housing and Urban Development

C. T. Conover
Comptroller of the Currency

William M. Isaac
Chairman
Federal Deposit Insurance Corporation

Edgar F. Callahan
Chairman
National Credit Union Administration

Mission

The mission of the Neighborhood Reinvestment Corporation is to:

1. Assist local communities to revitalize neighborhoods for the benefit of current residents.

2. Develop, through educational processes, working partnerships of residents, local government officials, and financial institution and business community representatives to accomplish neighborhood revitalization.

3. Discover, test, and replicate neighborhood program models which promote reinvestment in neighborhoods; and which

   (a) exert a long-term stabilizing influence on the neighborhood economic environment, and

   (b) lead to a perceived improving quality of life which will strengthen weak demand factors in the neighborhood real estate market.

4. Provide on-going training and technical services to local programs to ensure their continuing effectiveness.

Problem Being Addressed

The problem being addressed by the Neighborhood Reinvestment Corporation is disinvestment in older neighborhoods. The physical characteristics of a neighborhood suffering disinvestment include under-maintenance of structures, declining or stagnant market values, vacant and abandoned buildings, demolition of structures, lack of viability of neighborhood commercial areas, and limited public services and under-maintenance of the public infrastructure.

Accompanying these physical conditions - partially causing the conditions and partially being caused by the conditions - are problems of a deterioration of the social fabric of the neighborhood. These include, in varying degrees, reduced homeownership, increased transiency, increased crime, arson, etc.

Neighborhoods are affected by these conditions in varying degrees. A neighborhood severely impacted by all of the above problems might be beyond salvage given the present state of the art. Neighborhoods with varying lesser degrees of problems can be "turned around" through appropriate reinvestment strategies and the utilization of varying amounts of resources. Neighborhood Housing Services (NHS) programs operate in neighborhoods with defined boundaries characterized by: (a) a housing stock showing evidence of deterioration and lack of maintenance; (b) an inadequate degree of mortgage and home improvement activity; (c) a substantial degree of homeownership; (d) an income mix in the neighborhood as low as resources will permit (very low family incomes and high repair costs will require raising additional resources for revolving loan funds and staffing); and (e) a neighborhood which, for example, may contain 500-2,000 units. Multiple neighborhoods are encouraged where resources can be raised to adequately serve each neighborhood.

We estimate that several hundred such neighborhoods throughout the nation are at pivot points where intervention by a local partnership equipped with NHS tools can tip the balance from decline to revitalization.

The problem being addressed has been intensified and complicated by recent economic developments. High rates of inflation eroded the purchasing power of neighborhood residents and at the same time increased the costs of needed repairs. High utility costs continue to exacerbate the problem, requiring, in areas of climatic extremes, significant weatherization outlays in order to reduce annual utility expenditures. Several years of high interest rates have reduced conventional borrowing, resulting in some cases in deferred maintenance and decreased owner occupancy.

Central to the problem of disinvestment is a lack of confidence in the neighborhood by the residents themselves, the private sector, and governmental bodies. Because of this factor and the interactive nature of causes and effects, it has been difficult for any one sector to address the problem. The private sector - particularly financial institutions which have been widely criticized for "redlining" - cannot affect the underlying conditions simply by changing lending policies or insurance underwriting standards. Residents lack the resources to pull themselves up by their bootstraps, however much they may be willing to try, and few governmental approaches have been able to deal comprehensively with the problems and to comprehensively marshall the public, private, and citizen resources required. A comprehensive, coordinated strategy which can simultaneously rekindle confidence in the neighborhood by all significant actors is requisite to successfully address the problems of disinvestment in older neighborhoods.

Rationale for Federal Role

In the Housing and Community Development Act of 1974, Congress declared that: (1) there is "inadequate public and private investment and reinvestment in housing and other physical facilities and related public and social services, resulting in the growth and persistence of urban slums and blight and the marked deterioration of the quality of the urban environment"; and (2) that "the future welfare of the nation and the well-being of its citizens depend on the establishment and maintenance of viable urban communities as social, economic and political entities and requires systematic and sustained action by Federal, state and local governments to eliminate blight, to conserve and renew older urban areas, to improve the living environment of low and moderate income families, and to develop new centers of population growth and economic activity; and substantial expansion and greater continuity in the scope and level of Federal assistance, together with increased private investment in support of community development activities ..."

In April, 1982 the President's Commission on Housing reported that: "Continued maintenance and upgrading of housing quality are also important to the supply of housing because they help prevent losses from the inventory. Reinvestment activity which creates more units or which extends the life of existing units enhances the neighborhoods in which the units are located, creating value and providing a further economic rationale for neighborhood housing preservation."

In the Neighborhood Reinvestment Corporation Act, Congress found that "the Neighborhood Housing Services demonstration of the Urban Reinvestment Task Force has proven its worth as a successful program to revitalize older urban neighborhoods by mobilizing public, private and community resources at the neighborhood level; and the demand for Neighborhood Housing Services programs in cities throughout the United States warrants the creation of a public corporation to institutionalize and expand the Neighborhood Housing Services programs and other programs of the present Urban Reinvestment Task Force." The act further stated that "the purpose of this title is to establish a public corporation which will continue the joint efforts of the Federal financial supervisory agencies and the Department of Housing and Urban Development to promote reinvestment in older neighborhoods by local financial institutions working cooperatively with community people and local government and which will continue the nonbureaucratic approach of the Urban Reinvestment Task Force, relying largely on local initiative for the specific design of local programs."

Because of the local, private nature of the NHS programs, Neighborhood Reinvestment's work is one of the most cost-beneficial activities sponsored by the Federal government. Supported by privately raised operating budgets, the local programs also provide a vehicle for effectively targeting Federal Community Development Block Grant funds to neighborhoods where they are needed.

The Corporation has consistently stimulated local, private and public initiative, and the NHS's ability to survive in today's difficult economic climate is proving the value of the technical services and secondary market resources which Neighborhood Reinvestment provides regionally and nationally.

A review of the results of this Corporation's ability to mobilize private investment; to secure thousands of volunteer hours of support by neighborhood residents, financial institution and other business leaders, and local government officials; and to have a measurable impact on turning declining neighborhoods into healthy economic and social elements in the urban fabric has served to single it out for recognition by the Administration.

Objectives

The Neighborhood Reinvestment Corporation's goals are to:

1. Develop local Neighborhood Housing Services programs which manage comprehensive, coordinated reinvestment strategies.
2. Seek out additional promising strategies and techniques for reversing factors which negatively impact the quality of life in neighborhoods.
3. Select the most promising strategies and techniques, and
   (a) monitor them and evaluate their effectiveness and replicability;
   (b) replicate them on a pilot basis in varying environments, working out systematic developmental (educational) processes; and
   (c) replicate them in additional communities where they are needed.
4. Provide training and technical services to local programs to ensure their continuing effectiveness, including:
   (a) information and training for local partnership members;
   (b) training and education for local program staff;
   (c) technical materials and systems for local programs; and
   (d) a secondary market for Revolving Loan Fund loans of local programs.
5. Disseminate information.
6. Provide an effectively administered organization to accomplish the Neighborhood Reinvestment Corporation's goals and objectives.

The main vehicle employed by Neighborhood Reinvestment for addressing the problem of disinvestment in older neighborhoods is the Neighborhood Housing Services program (see Appendix C). These local, nonprofit corporations are establishing themselves as continuing institutions in 129 cities, committed to reinvestment in a series of neighborhoods. NHS programs are created by Neighborhood Reinvestment through a sophisticated developmental process which involves building a working partnership among the local business and financial institution leaders, government officials, and residents of a community (see Appendix C). The majority of human and financial resources utilized are derived locally, with Neighborhood Reinvestment staff providing expertise in group educational processes, organizational development, and technical reinvestment strategy and implementation areas. In twelve years of work in this area, the Neighborhood Reinvestment Corporation and its predecessor, the Urban Reinvestment Task Force, have developed NHS programs in 179 neighborhoods nationwide.

Neighborhood Reinvestment's function of providing neighborhood program training and technical services guarantees that, once developed, these programs can remain viable and effective. Direct staff assistance ensures that a local NHS program can draw upon experienced personnel to solve difficult technical problems. In the event of unexpected local staff turnover, an interim executive director can help an NHS weather what could otherwise have been a fatal crisis. Training workshops and conferences help build and enhance the skills of local NHS staff members in areas essential to the successful operation of their programs. This includes neighborhood strategizing, and administrative and executive skills, as well as technical skills related to lending and housing rehabilitation.

A secondary market provides a flow of capital into local NHS Revolving Loan Funds, tapping institutional investor resources to leverage capital provided by the Neighborhood Reinvestment Corporation.

Finally, Neighborhood Reinvestment provides, through an organized process, programmatic tools to supplement this basic NHS model. This process includes: (1) the identification and monitoring of promising local efforts which are successfully dealing with neighborhood problems beyond the scope of the basic NHS program; (2) testing of these new tools in additional locations; and (3) making the new programmatic components available to NHS neighborhoods which require them in order to successfully revitalize their neighborhoods.

These new tools enable NHSs to deal with the ever-tightening rental market, more distressed neighborhoods, neighborhoods with higher proportions of renters and apartment buildings, more blighted buildings, scattered vacant lots, blighted commercial areas, etc.

Program Highlights and Accomplishments

By the end of FY 1983, Neighborhood Housing Services programs will be serving approximately 198 neighborhoods in 137 cities. NHS programs will be operating in approximately 44 states and the District of Columbia. (For a more complete description of NHS programs, see Appendix C.)

NHS programs operate in most of the large cities. Of the 56 cities over 250,000 population, at least 42 will have NHS programs by the end of FY 1983. At the other end of the scale, among a growing number of small cities served, NHS will constitute the main neighborhood revitalization and housing rehabilitation activity in over a score of cities under 30,000 population. One-fifth of the neighborhoods have populations 85% or more minority. One-fifth of the neighborhoods have populations 15% or less minority and the other three-fifths of NHS neighborhoods have populations which are between 15% and 85% minority. The neighborhoods served range from neighborhoods as small as 725 dwelling units to neighborhoods as large as 10,000 dwelling units. The average neighborhood size is 2,500 units. Populations are as small as 1,500 and as large as 26,000. Over 1,500,000 people live in NHS neighborhoods.

Financial Development — Neighborhood Housing Services of America (NHSA) is making excellent progress in its financial development effort described more fully in Appendix H. Grant funds provided by Neighborhood Reinvestment have been applied to obtain maximum lasting progress — focusing first on good preparation and good training, and then on actual fund raising activities, with local fund raising needs given priority. Results have included:

- A fund raising feasibility study to determine both opportunities and areas of work needed to conduct a successful effort.

- Concensus building to achieve unanimous goals toward a national fund raising effort among all the NHSs.

- Intensive fund raising training throughout the NHS network in well over a hundred sessions.
- Development and wide distribution of an NHS fund raising guide plus expansions to reflect new NHS fund raising approaches as they evolve.
- Consultation of NHSA professional fund raising counsel or on-site meetings as necessary with Neighborhood Reinvestment staff in direct fund raising counseling of well over a hundred NHSs.
- Hands-on management of five successful or succeeding NHS local campaigns along with pre-campaign work in two additional areas.
- Successful application to The Advertising Council, Inc. for an NHS business press campaign.
- Completion of the research and files development necessary to activate the corporate contributions portion of the national campaign.

After over a year of painstaking work with local NHS programs and a representative fundraising advisory committee, the following concensus was reached:

1. That every effort be made to launch a nationwide fund raising campaign at the earliest possible date. The goals of this effort would be to maximize the potential for the receipt of private funds to benefit NHS programs. Priority will be given to building local capability and contacts out of the process of the fund raising campaign which will help local fund raising for operating budgets, revolving loan funds, and special projects.
2. That the Fund Raising Advisory Committee, as expanded to include representatives from the cities where corporate fund raising activity would be most active, become a standing NHS Fund Raising Advisory Committee.
3. That the net proceeds, after payment of expenses of the campaign, be distributed in accordance with the following formula:
    a. Approximately 10% of the proceeds will be used for direct staff assistance to NHSs to broaden the base of annual support via technical assistance, training, and other appropriate mechanisms.

    b. The balance of the net proceeds of the drive would be used for the broad secondary market needs of the NHS programs. A leverage of at least 3-to-1 on these proceeds is anticipated through loan sales to NHSA for the existing secondary market programs and new ones as needed.

This campaign emphasis will complement the sale of NHS secondary market securities to institutional investors, providing the resources necessary for over-collateralization, interest subsidies, guarantee funds, and administrative costs. This added private support is urgently needed for the secondary market for NHS revolving loan funds as the demand has now far outstripped Neighborhood Reinvestment's capacity to support it alone.

Work is underway to enlist campaign leadership and to begin broadening the public awareness of NHS.

A. FY 1983 ACCOMPLISHMENTS

By the close of fiscal year 1983, Neighborhood Reinvestment will have achieved the following results:*

Neighborhood Housing Services: Establishing New, Supplementing Existing and Providing Technical Services

- Development activities will be well underway in 15 cities, either initiating a new NHS or expanding an existing one. In addition, work will have been completed on approximately 15 NHS development efforts (5 new and 10 expansions) that were in process when FY 83 began. This will bring NHS programs to a total of 198 neighborhoods in 137 cities.

- Through FY 1983, NHS programs will have raised approximately $67.7 million for operations, lent about $60.4 million in revolving loan fund loans, and generated over $1.7 billion in total reinvestment.

- During FY 83 rural NHS developments in Richland Center, Wisconsin; and Barre/Randolph/East Bethel, Vermont will be completed. Coupled with the operational experience in Cattaraugas County, New York, these programs will allow for a preliminary evaluation of the NHS partnership approach in a predominately rural setting.

- Work will have begun to replicate the following NHS programmatic components: 7 Problem Properties Strategies, 4 Insurance Full Partnership programs, 5 Owner Built Housing Programs, 2 Commercial Revitalization Programs and 2 Energy Conservation programs. In addition, the following programmatic components, begun in a previous fiscal year, will become operational: 9 Problem Properties Strategies, 3 Insurance Full Partnership programs, 6 Owner-Built Housing programs, 3 Commercial Revitalization programs, and one Urban Lender program.

- Training and technical services will be provided to 198 NHS neighborhood programs in 137 cities. These efforts will vary in intensity and duration depending on local circumstances and need, and are critically important to ensuring the ongoing strength and effectiveness of these local partnership programs.

- About 100 NHS partnerships will have been evaluated through onsite reviews.

- Capitalization grants provided to Neighborhood Housing Services of America's loan purchase pool will have leveraged over $12 million in cumulative agreements with institutional investors to purchase collateralized securities. NHSA purchases of revolving loan fund loans from NHS programs will cumulatively total over $[illegible]0 million through FY 83.

- Comprehensive two- to four-week training programs will have been conducted for 125-130 first time NHS directors and construction specialists. These programs are designed to provide education in the operational aspects of the program as well as training in technical components, including creative financing and loan processing, bidding, specification writing and construction monitoring, real estate law, etc.

- In addition to the above, ongoing training and educational opportunities will be provided to local program staffs and partnerships through carefully planned conferences and workshops. Over 2,000 staff and partnership members will have participated in these training and education opportunities.

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*Final program activity goals for FY 1983 are subject to Board approval. This applies to all references throughout the Budget Justification regarding FY 1983 and FY 1984 program goals, line item comparisons, and revenue and expense projections.

Apartment Improvement Program

- Five new Apartment Improvement Program developments will have been started, and 9 AIPs begun in a previous fiscal year will have become operational.

- Training and technical services will have been provided to 19 programs. These services will have varied in duration and intensity depending on local circumstances and need. Financial analysis, loan packaging, tenant-owner communication, and training in the transfer and operations of the (computerized) Real Estate Investment Analysis Model are among the technical services most frequently provided.

- AIP programs will have initiated about $24 million in conventional improvement loans and refinancing during FY 1983. This will result in over 3,000 rehabilitated rental units for people of modest incomes.

Research and Pilot Replication

- Additional Neighborhood Preservation Projects which offer innovative approaches to addressing common NHS neighborhood concerns will have been identified and evaluated. Emphasis will have been on lower cost, smaller scale programs which may be more widely transferable through "how-to-do-it" manuals.

- A preliminary evaluation of the utilization of micro-computers in NHS program administration will have been completed.

- The Baltimore Mutual Housing Association will have begun construction on phase one of the eventual 150 units of two-story brick townhouses. A second demonstration site which will allow for testing the development model in a different environment will have been selected.

B. BUDGET REQUEST FOR FISCAL YEAR 1984

This budget request for fiscal year 1984 is a justification for the amount recommended by the Office of Management and Budget as contained in the Budget of the United States, Fiscal Year 1984. The total request for a Congressional appropriation of $15,512,000 would provide the same level of federal funding as was provided in fiscal 1983. The following section contains summary tables and line item descriptions for Neighborhood Reinvestment's proposed fiscal year 1984 budget.

In 1983, the Neighborhood Reinvestment Corporation received funds from the Federal Home Loan Bank System, the Federal Deposit Insurance Corporation, the Comptroller of the Currency and the Federal Reserve Board. The total amount of this support was $1,209,016. In 1984 this source of funds will no longer be available to the Corporation, and the items funded from this source, will be absorbed within the Congressionally appropriated funds available to the Corporation. Overall there will be a reduction in funding of approximately $1,778,000 when compared to the amount available from all sources in fiscal 1983.

C. BUDGET SCHEDULES - FY 1982-84

The budget schedules that follow present the sources and uses of funds for fiscal years 1982, 1983, and 1984, and provide comparisons of expenditures by line item and program element. Also included in this section is a comparison of Neighborhood Reinvestment's programmatic goals for the three year period beginning in fiscal 1982.

1. Neighborhood Reinvestment Corporation Sources and Uses of Funds for Fiscal Years 1982, 1983, and 1984

In Tables 1, 2, and 3, which follow, combined projections of all sources and application of funds are shown. The Corporation receives its primary funding through a Congressional appropriation.

In fiscal 1982, the Corporation received additional support through the Office of Neighborhood Reinvestment of the Federal Home Loan Bank System. In fiscal 1983, this support was shared among the Federal Home Loan Bank System, the Federal Deposit Insurance Corporation, the Comptroller of the Currency, and the Federal Reserve Board all of which are represented on the Neighborhood Reinvestment Board of Directors. In fiscal 1984, it is anticipated that this funding will no longer be available. The individual amounts contributed by Board Member entities are shown below:

Board Member Contributions FY 1982-1984
(amounts in thousands)

	Fiscal Year Contribution		
Board Entity	FY 1982	FY 1983	FY 1984
Federal Home Loan Bank System	$1,916	$ 409	-0-
Federal Deposit Insurance Corporation	-0-	200	-0-
Comptroller of the Currency	-0-	200	-0-
Federal Reserve Board	-0-	400	-0-
TOTAL Board Member Contribution	$1,916	$1,209	-0-

The fiscal 1983 contribution from Board Member entities will fund the salaries of the seven Neighborhood Reinvestment Corporation's officers and one other employee; related travel and telephone expenses; and a portion of the rent and related costs of its headquarters office located at 1850 K Street, N.W., in Washington, D.C.

The Corporation often receives funds from local governments and other entities to pay the direct local costs of developing Neighborhood Housing Services programs. The amounts shown represent a projection of services provided in connection with these development activities. Neighborhood Reinvestment serves as the fiscal agent for the disbursement of these funds. The use of the funds is restricted to paying the developmental cost of particular projects and cannot be used to defray general expenses of the Corporation. A decrease in this source of funds from $315,000 in fiscal 1983 to $280,000 in fiscal 1984 is projected because of a slight reduction in NHS programs to be developed in new cities that year.

Table 1
NEIGHBORHOOD REINVESTMENT CORPORATION
REVENUE AND EXPENSES - ALL SOURCES OF FUNDS
FISCAL YEAR 1982 ACTUAL
(amounts in thousands)

	CONGRESS APPROP	FEDERAL HOME LOAN BANK SYSTEM	OTHER INCOME	PROJECT FUND	TOTAL
SOURCES OF FUNDS:					
Federal Appropriation	$13,872				$13,872
Federal Home Loan Bank System		$1,917			1,917
Local Governments (for services rendered)				$671	671
Interest (projected earnings)			$1,266		1,266
Balance, Start of Year			1,159		1,159
TOTAL SOURCES	13,872	1,917	2,425	671	18,885
USES OF FUNDS:					
Salaries & Benefits	6,650	470		510	7,630
Travel	2,106	100		188	2,394
Professional Services	489			120	609
Conferences & Workshops	315			136	451
Rent	283	519		15	817
Telephone, Postage & Delivery	421	157		51	629
Printing and Supplies	365			50	415
Other General & Administrative	376	671	143	107	1,297
Grants & Grant Commitments	2,867		1,795	(506)	4,156
TOTAL EXPENDED	13,872	1,917	1,938	671	18,398
UNOBLIGATED BALANCE, END OF YEAR			487		487
TOTAL USES	$13,872	$1,917	$2,425	$671	$18,885

Table 2
NEIGHBORHOOD REINVESTMENT CORPORATION
SOURCES AND USES OF FUNDS - ALL SOURCES
FISCAL YEAR 1983 PROJECTED
(amounts in thousands)

	CONGRESS APPROP	FEDERAL HOME LOAN BANK SYSTEM	OTHER AGENCIES	OTHER INCOME	PROJECT FUND	TOTAL
SOURCES OF FUNDS:						
Federal Appropriation	$15,512					$15,512
Federal Home Loan Bank System		$409				409
Other Agencies			$800			800
Local Governments					$315	315
Interest (projected earnings)				$904		904
Balance, Start of Year				487		487
TOTAL SOURCES	15,512	409	800	1,391	315	18,427
USES OF FUNDS:						
Salaries & Benefits	6,926	228	284		334	7,772
Travel	1,955	65	60		123	2,203
Professional Services	458				79	537
Conferences & Workshops	417				89	506
Rent	763	34	256		10	1,063
Telephone, Postage & Delivery	394	42	154		33	623
Printing and Supplies	425				33	458
Other General & Administrative	483	40	46		70	639
Grants & Grant Commitments	3,691			1,391	(456)	4,626
TOTAL USES:	$15,512	$409	$800	$1,391	$315	$18,427

Table 3
NEIGHBORHOOD REINVESTMENT CORPORATION
SOURCES AND USES OF FUNDS - ALL SOURCES
FISCAL YEAR 1984 PROPOSED
(amounts in thousands)

	CONGRESS APPROP	OTHER INCOME	PROJECT FUND	TOTAL
SOURCES OF FUNDS:				
Federal Appropriation Request	$15,512			$15,512
Local Governments (for services rendered)				
Interest (projected earnings)			$280	280
		$857		857
TOTAL SOURCES	15,512	857	280	16,649
USES OF FUNDS:				
Salaries & Benefits	6,988		312	7,300
Travel	1,900		162	2,201
Professional Services	426		78	504
Conferences & Workshops	460		84	544
Rent	1,180		6	1,047
Telephone, Postage & Delivery	594		33	627
Printing and Supplies	370		33	403
Other General & Administrative	548		72	620
Grants & Grant Commitments	3,046	857	(500)	3,403
TOTAL USES	$15,512	$857	$280	$16,649

An additional source of funding included in the printed budget schedules is a projection of interest earned. The Corporation earned about $1.3 million on its fund balance in fiscal 1982. In 1983, the earnings from this source are expected to be approximately $904,000 and in fiscal 1984 about $857,000. The decline in these projected earnings is due to the following: the expectation that interest rates will remain stable at their current level of around 8% through December of this year when the major portion of the Corporation's fiscal 1984 investments are to be made; and the timing of the receipt of its annual appropriation. The fiscal 1984 projection is based on receipt of the appropriated funds in late November or early December as was the case in fiscal 1983. Total interest earnings on the 1983 appropriation funds will be $600,000. Additional interest earnings of approximately $304,000 will be made on the Corporation's obligated cash balances. These earnings are also expected to decline in fiscal 1984 due to declining fund balances.

In fiscal years 1983 and 1984, all of the Corporation's available interest earnings are applied to fund grants. This source of funding enhances the Corporation's ability to achieve its programmatic objectives. Its availability is taken into consideration in arriving at the Corporation's budget submission to the Office of Management and Budget.

2. Line Item Comparisons - Fiscal Years 1982-1983 Funding Request

Tables 4 and 5, on pages 26 and 27, provide a comparison of actual 1982 and projected 1983 and 1984 major line item expenses for Congressionally appropriated funds, and for all sources of funds. The justification for the request shown on Table 4 is provided by the paragraphs which follow:

Expense Category	Projected Expenses 1983	Budget Request 1984	Increase (Decrease)	% Change
Salaries & Benefits ($000s)	$6,926	$6,988	$62	0.9

This line item provides salary compensation for 197 permanent positions and associated employee benefits.

The major benefits included are:

1. Health Insurance
2. Life and Disability Insurance
3. Retirement Program
4. Vision Care
5. Worker's Compensation
6. Payroll Taxes

These items collectively are budgeted at 27% of gross salaries in fiscal 1984, which equals the percentage rate experienced in fiscal 1983.

Although this line shows a slight increase in the amount for salaries and benefits compared to FY 1983, the need to absorb seven officer's and one employee's salary previously funded by Board Member entities, as well as to provide funds for the annualization of FY 1983 increases and FY 1984 within grade increases, will require a significant reduction in staffing. The amount required to absorb staff costs now paid by other than direct congressional appropriations is approximately $564,000. The amount needed to fund FY 1983 annualizations and FY 1984 within grade increases is budgeted at a combined level of $277,000. The need to absorb these costs within a constant appropriation will require a reduction of about 28 staff members. This is a staffing reduction of approximately 12% compared to current levels.

Neighborhood Reinvestment Corporation staff are currently located in Washington, D.C. and nineteen field offices. These field offices house field staff who are directly involved in developmental processes and training and technical services across the nation. Office locations and the anticipated FY 1984 number of permanent employees to be assigned are listed below:

Washington, D.C.		84
Field Operations	5	
Field Services	9	
Program Services	8	
Administration:		
Executive Services	8	
General Counsel	4	
Communications	6	
Conferences	3	
Staff Development	7	
Finance and Administration	34	
Northeast Regional Office: Boston, MA		32
District Offices		
Boston, MA	11	
New York, NY	7	
Newark, NJ	8	
Yonkers, NY	6	
Atlantic-Great Lakes Regional Office: Atlanta, GA		35
District Offices		
Atlanta, GA	10	
Charlotte, NC	4	
Chicago, IL	15	
Cincinnati, OH	6	
Central Regional Office: Kansas City, MO		22
District Offices		
Kansas City, MO	10	
Dallas, TX	9	
Madison, WS	3	
Western Regional Office: San Francisco, CA		24
District Offices		
Oakland, CA	15	
Denver, CO	3	
Salt Lake City, UT	1	
Seattle, WA	5	
		197

Expense Category	Projected Expenses 1983	Budget Request 1984	Increase (Decrease)	% Change
Travel ($000s)	$1,955	$2,039	$84	4.3

This line item provides funds for the business travel and related expenses for staff and for non-staff members who participate as resources in Neighborhood Reinvestment planning workshops. All air travel is calculated at economy airfare, hotel rates up to $40.00 per day (except in certain high cost cities), and meals at a maximum of $20.00 per day.

The 4.3% increase in the travel budget is needed to replace travel funds previously provided by Board Member agencies. When this factor is taken into consideration travel expenses are expected to remain approximately equal to those anticipated in fiscal 1983, although inflationary increases in airfares and hotel rates will continue to take place. The ability to absorb inflation in travel costs is based on the overall lower staffing level expected in FY 1984 and a continued policy of taking advantage of economy fares and using low cost non-profit facilities for meetings and training events whenever possible.

Expense Category	Projected Expenses 1983	Budget Request 1984	Increase (Decrease)	% Change
Professional Services ($000s)	$458	$426	($32)	(7.0)

This line includes the cost for professional services provided through professional service contracts. It is expected that this cost will decline between fiscal 1983 and 1984. Many items in this category are unavoidable expenses such as legal fees, audit fees, and payroll services. Other expenses such as those for training consultants are related to the level of services provided to NHS programs, and since this is expected to be maintained in fiscal 1984, use of professional training specialists will also remain approximately equal to FY 1983 levels. It is unlikely that staff services could be substituted due to the overall reduction in staffing levels planned for fiscal 1984, and the likelihood of increased workload per remaining staff person. A schedule of professional service expenses planned for fiscal 1983 and 1984 follows:

Professional Services
(amounts in thousands)

	Projected Expenses 1983	Budget Request 1984	Increase (Decrease)	% Change
NHS Program/Training	$ 36	$ 32	($4)	(11.1)
Program Development	200	201	1	0.5
Accounting Services(EDP)	38	42	4	10.5
Legal Fees	30	30	-0-	-0-
Audit Fees/Internal Control	20	17	(3)	(15.0)
Publications	5	4	(1)	(20.0)
Staff Development	75	75	-0-	-0-
Personnel	18	16	(2)	(11.1)
Prog. Info. & Research	36	9	(27)	(75.0)
TOTAL	$458	$426	($32)	(7.0)

Expense Category	Projected Expenses 1983	Budget Request 1984	Increase (Decrease)	% Change
Conferences & Workshops ($000s)	$417	$460	$43	10.3

This line item provides funds for expenses related to the educational conferences, training workshops, and staff meetings held by Neighborhood Reinvestment. The $43,000 increase in this line item reflects anticipated cost increases, an expansion in the number of regional and district conferences and workshops, and a higher level of participation in all activities due to the growth in the number of operating NHS programs.

Expense Category	Projected Expenses 1983	Budget Request 1984	Increase (Decrease)	% Change
Rent ($000s)	$763	$1,041	$278	36.4

The 36.4% increase in rent to be funded by appropriated funds results from the need to absorb the remaining portion of office rent for the Washington office now funded by Board Member entities. In fiscal 1983, $290,000 of the $717,000 needed for office space rental in Washington is funded by other than Congressional appropriations. The $278,000 increase requested in this line

will be to replace a portion of this funding. The overall decrease in rent costs of 1.5% when all sources of funds are considered will be achieved by allowing the leases on some office space to lapse, or by subletting existing office space in locations where staffing reductions would make this possible.

The field offices which, in addition to the Washington headquarters will be funded by this line are the following:

1. Northeast Region

   Northeast Regional & New England District Office - Boston, MA
   New York District Office - New York, NY
   Mid-Atlantic District Office - East Orange, NJ

2. Eastern Region

   Eastern Regional & Southeast District Office - Atlanta, GA
   Mid-South District Office - Charlotte, NC
   Mid-West District Office - Cincinnati, OH

3. Central Region

   Central Region & Great Plains District Office - Kansas City, MO
   South Central District Office - Dallas, TX
   Mid-America District Office - Madison, WI

4. Western Region

   Western Regional & California District Office - Oakland, CA
   Northwest District Office - Seattle, WA
   Southwest District Office - Salt Lake City, UT

5. NHS Staff Training Center - Chicago, IL

6. Apartment Improvement Program Office - Yonkers, NY

These regional and district offices house field staff who are directly involved in the developmental process and training and technical services across the nation. In Atlanta, Boston, Oakland, and Kansas City, regional and district offices are housed in the same facility. Other offices for one or more staff members have been set up within districts to minimize travel. It has not yet been decided which of these offices will be closed or subleased to achieve projected savings.

Expense Category	Projected Expenses 1983	Budget Request 1984	Increase (Decrease)	% Change
Telephone, Postage, and Delivery ($000s)	$394	$594	$200	50.8

This line provides funds for communication expenses of the Corporation including telephone installation in the Washington and field offices, and local and long distance toll charges for offices and individual staff members on business travel. Also included are Washington and field office postage and delivery needs.

In fiscal 1983, approximately 34% of funds allocated to telephone, postage, and delivery expenses of the Corporation are derived from contributions by Board Member entities. The replacement of approximately $196,000 obtained from Board Member contributions by appropriated funds permits activity to be sustained in fiscal 1984. Overall increases in telephone, postage, and delivery rates are expected to raise costs by about 3% when all sources of funds are considered.

Expense Category	Projected Expenses 1983	Budget Request 1984	Increase (Decrease)	% Change
Printing & Supplies ($000s)	$425	$370	($55)	(12.9)

This line item provides funds for the development and printing of the annual report, quarterly newsletters, and several brochures on Neighborhood Reinvestment activities. In addition, the printing of manuals, forms, and letterhead are funded by this line item. Also included are photographic supplies and visual materials, as well as general office supply needs.

The 12.9% reduction in this line will be achieved by making maximum use of quantity discounts, discounts for early payment and economies in the use of supplies.

Expense Category	Projected Expenses 1983	Budget Request 1984	Increase (Decrease)	% Change
Other General and Administrative ($000s)	$483	$548	$65	13.5

This category of expense includes insurance, temporary clerical services, equipment rental and maintenance, subscriptions, publications, professional dues, classified ads, purchases of equipment and furniture, and miscellaneous expenses.

The 13.5% increase in this line results from the need to absorb expenditures formerly funded by Board Member entities within Congressionally appropriated funds available to the Corporation. In fiscal 1983, $83,000 for the annual payment on a note held by the Federal Home Loan Mortgage Corporation secured by the Corporation's Washington office furniture and $3,000 for miscellaneous office expenses was funded by Board Member entities. The additional funds requested in this line will partially offset these costs in fiscal 1984. Overall administrative costs of the Corporation will be reduced in FY 1984 compared to FY 1983 in spite of price increases that are expected to occur. The corporation is currently studying options available to achieve this economy.

The following is a detailed comparison of FY 1983 and FY 1984 expenses in this category.

Description	Projected Expenses 1983	Budget Request 1984	Increase (Decrease)	% Change
Insurance	$ 15,700	$ 17,000	1,300	8.3
Agency Fee/Temp Help	60,476	56,000	(4,476)	(7.4)
Temp Clerical Svcs	30,189	25,000	(5,189)	(17.2)
Equipment Rental	171,459	165,000	(6,459)	(3.8)
Equipment Maintenance	45,358	45,000	(358)	(0.8)
Pubs, Dues & Subs	38,721	35,000	(3,721)	(9.6)
Classified Ads	18,806	15,000	(3,806)	(20.2)
Miscellaneous	22,151	25,000	2,849	12.9
Furniture/Equipment	79,718	165,000	85,282	107.0
TOTAL	$482,578	$548,000	$65,422	13.6

Expense Category	Projected Expenses 1983	Budget Request 1984	Increase (Decrease)	% Change
Grants and Grant Commitments ($000s)	$3,691	$3,046	($645)	(17.5)

This line item provides for the following types of grants: Neighborhood Housing Services grants to seed the revolving loan funds of new and expansion programs; Apartment Improvement Program grants to help defray initial operating costs particularly in the area of the computerized Real Estate Investment Analysis Model (REIAM); Neighborhood Program Development grants to assist NHS programs undergoing pilot replications of programmatic supplements; Neighborhood Preservation Projects grants to administratively support innovative, locally-operated neighborhood preservation programs that offer solutions to common NHS neighborhood concerns; Training and Educational grants to local NHS and AIP programs to ensure that program partnership and staff members are able to participate in specific training programs and educational workshops; Project Development funds to support individual program developments (particularly NHS expansion, AIP and NPD); and Neighborhood Housing Services of America grants to further capitalize the national loan purchase pool, fund related operating costs, and provide for other contractual services, such as Mutual Housing Association development services.

A list of estimated grant amounts to be funded in fiscal year 1984 follows:

NHS Grants	$ 630,000
AIP Grants	60,000
NPD Grants	590,000
NPP Grants	240,000
Training and Educational Grants	760,000
NHSA Grants	1,122,850
TOTAL	3,402,850
Amount funded from other sources	(356,850)
Appropriated Funds	$3,046,000

A decrease in federal funding for this line is representative of an overall reduction in fiscal 1984 funding. Program output goals in both Neighborhood Program Development and Neighborhood Preservation Projects are slightly less than in fiscal 1983, and grants to Neighborhood Housing Services of America in support of the nationwide financial development effort have been reduced. It is anticipated that contributions resulting from the financial development effort will help offset this reduced level of support.

Table 4
NEIGHBORHOOD REINVESTMENT CORPORATION
LINE ITEM COMPARISONS
FISCAL YEARS 1982-1984 - FEDERAL APPROPRIATIONS
(amounts in thousands)

			FY 1982-1983			FY 1983-1984	
	FY 1982	FY 1983	Difference	$ Change	FY 1984	Difference	$ Change
Salaries & Benefits	$ 6,650	$ 6,926	$ 276	4.2	$ 6,988	$62	.9
Travel	2,106	1,955	-151	-7.2	2,039	84	4.3
Professional Services	489	458	-31	-6.3	426	-32	-7.0
Conferences & Workshops	315	417	102	32.4	460	43	10.3
Rent	283	763	480	169.6	1,041	278	36.4
Telephone, Postage, and Delivery	421	394	-27	-6.4	594	200	50.8
Printing and Supplies	365	425	60	16.4	370	-55	-12.9
Other General and Administrative	376	483	107	28.5	548	65	13.5
Grants and Grant Commitments	2,867	3,691	824	28.7	3,046	-645	-17.5
TOTAL	$13,872	$15,512	$1,640	11.8	$15,512	0	0

Table 5
NEIGHBORHOOD REINVESTMENT CORPORATION
LINE ITEM COMPARISONS
FISCAL YEARS 1982-1984 - ALL SOURCES OF FUNDS
(amounts in thousands)

	FY 1982	FY 1983	FY 1982-1983		FY 1984	FY 1983-1984	
			Difference	% Change		Difference	% Change
Salaries & Benefits	$ 7,630	$ 7,772	142	1.9	$ 7,300	-472	-6.1
Travel	2,394	2,203	-191	-8.0	2,201	-2	-.1
Professional Services	609	537	-72	-11.8	504	-33	-6.1
Conferences & Workshops	451	506	55	12.2	544	38	7.5
Rent	817	1,063	246	30.1	1,047	-16	-1.5
Telephone, Postage, and Delivery	629	623	-6	-1.0	627	4	0.6
Printing and Supplies	415	458	43	10.4	403	-55	-12.0
Other General and Administrative	1,297	639	-658	-50.7	620	-19	-3.0
Grants and Grant Commitments	4,156	4,626	470	11.3	3,403	-1,223	-26.4
Unobligated Balance - End of Year	487	0	-487	-100	0	0	0
TOTAL	$18,885	$18,427	-458	-2.4	$16,649	-1,778	-9.6

3. Program Goals and Funding Request

Tables 6 and 7 provide a comparison of fiscal 1982, 1983 and 1984 program goals and funding requirements in the following categories:

NHS Development (New & Expansion Starts)

Programmatic Supplements - Pilot Replications
 Problem Properties Strategies
 Insurance Full Partnership
 Owner-Built Housing
 Commercial Revitalization
 Energy Conservation

Training and Technical Services
 Ongoing Training and Technical Services
 Program Reviews and Evaluations
 Secondary Market Capitalization Grant
 Training New Directors & Construction Specialists
 Local Program Staff & Partnership Training/Conferences & Workshops

AIP Development

AIP Training and Technical Services

Neighborhood Preservation Projects

Mutual Housing Association Development

Neighborhood Housing Services are nonprofit state-chartered corporations. Each is responsible for raising its own budget, setting its own policy and carrying out its own activities. There is a wide variety among NHSs in terms of neighborhood setting, budget, programmatic emphasis and program complexity.

NHSs are strengthened by the availability of Neighborhood Reinvestment's training and technical services on a long-term basis. As local, nonprofit corporations with small, skilled staffs and voluntary boards, most NHSs experience periodic staff and board turnover. Neighborhood Reinvestment provides reliable training and educational resources to assist programs in coping with such normal turnover. Neighborhood Reinvestment also provides assistance to programs in evaluating and adjusting program direction and systems.

The success of the NHSs in stabilizing declining neighborhoods has to no small degree been due to their ability to be effective over the long haul. Neighborhoods don't decline overnight and reversing disinvestment requires time as well.

The NHS partnership volunteers provide most of the technical input needed through board, committee and community activities. Neighborhood Reinvestment also offers a range of technical services to meet pressing needs of the NHS network. These are some of the major technical services:

- training courses for NHS executive directors and rehabilitation specialists;
- training conferences for NHS staff, board members and other volunteers;
- on-site assistance with bookkeeping, loan processing and servicing, client tracking and other program systems; and
- on-site board workshops on neighborhood improvement strategies, goal setting and program re-evaluation.

Over time, the profile of technical services has shifted. Several years ago, for instance, much of our executive director training was aimed at executives entering programs in the start-up phase of operations. Now most of the executives are being trained to take over an existing program, due to staff turn-over among the larger group of operational NHSs. Another area of assistance which is of growing importance is how to phase down services in neighborhoods where revitalization goals have been accomplished, in such a way that an ongoing mechanism remains to continue high standards of neighborhood maintenance.

Although every NHS does not utilize every technical service, it is difficult to overestimate the extent to which timely assistance has enabled NHSs to continue to meet their goals. All too frequently other neighborhood nonprofit organizations must fold — with goals unmet, development costs lost and participants frustrated — when they experience difficulties. The challenging economic environment and limited resources of the early 1980s have required Neighborhood Reinvestment to develop quality technical services.

During FY 83, the greatest challenge for NHSs as thrift institutions' support has been threatened, has been securing funding resources. NHSs have obtained funds for their operating budgets primarily from the private sector. Capitalization of NHS revolving loan funds has come from a variety of sources, including modest seed grants from Neighborhood Reinvestment and grants from foundations, but primarily Community Development Block Grant funding through city governments. In the current economic climate, NHSs are broadening their funding base and seeking alternative funding resources, particularly for operating costs. Neighborhood Reinvestment is providing increased fund raising assistance and, in a few cases, direct reimburseable grants to help NHSs through cash flow crises. We are also assisting Neighborhood Housing Services of America (NHSA) in offering local fundraising counsel and preparing for a national fund raising campaign designed to re-capitalize the NHSA secondary market and defray the costs of regional NHS drives seeking operating budget funds.

The sophistication of Neighborhood Housing Services programs has grown with the years, and their ability to successfully revitalize/stablize neighborhoods has significantly increased. Part of the NHSs increased effectiveness has been due to Neighborhood Reinvestment's ability to provide them with a growing array of more sophisticated programmatic tools. These basic support activities and dissemination of information create an ongoing NHS network, which is continuing to grow as a uniquely capable mediating structure within this nation's neighborhoods.

Organizational Productivity

As our staff's experience base has broadened in providing technical services, their proficiency has also increased. We are providing more services to a larger number of programs, and anticipate doing so with a smaller staff and a reduced all sources budget in FY 1984. This continuing increase in productivity is a major achievement.

Table 6
NEIGHBORHOOD REINVESTMENT CORPORATION
SUMMARY OF MAJOR FY 1982-1984 GOALS AND FUNDING REQUEST

	1982	1983	1984
RESOURCE REQUIREMENTS			
Budget Authority ($000s)	$13,872	$15,512	$15,512
Other Income ($000s)	5,013	2,915	1,137
Total ($000s)	18,885	18,427	16,649
Positions - FTEs	232	225	197
NEIGHBORHOOD HOUSING SERVICES - ESTABLISHING NEW, SUPPLEMENTING EXISTING, AND PROVIDING TECHNICAL SERVICES			
NHS Development (New & Expansion) Starts	17	15	15
Continued Development from Prior Year	28	26	15
Programmatic Supplements - Pilot Replications			
Problem Properties Strategies Starts	4	7	5
Continued Developments from Prior Year	5	9	5
Insurance Full Partnership Starts	4	4	4
Continued Developments from Prior Year	1	3	2
Owner-Built Housing Starts	4	5	3
Continued Developments from Prior Year	1	6	4
Commercial Revitalization Starts	2	2	1
Continued Developments from Prior Year	3	3	1

Table 6 (continued)
NEIGHBORHOOD REINVESTMENT CORPORATION
SUMMARY OF MAJOR FY 1982-1984 GOALS AND FUNDING REQUEST

	1982	1983	1984
Energy Conservation Starts	2	2	1
Continued Developments from Prior Year	1	0	1
Training and Technical Services			
Ongoing Training and Technical Services (# of Programs)	173	198	211
Program Reviews and Evaluations (# of Reviews)	80	100	125
Secondary Market Capitalization Grant ($000s)	600	550	490
Training New Directors and Construction Specialists (# of Participants)	130	130	130
Local Program Staff and Partnership Training/Conferences and Workshops (# of Participants)	1,700	2,140	2,300
APARTMENT IMPROVEMENT PROGRAM			
AIP Development Starts	4	5	3
Continued Developments from Prior Year	6	9	4
AIP Training and Technical Services (# of Programs)	13	19	23
RESEARCH AND PILOT REPLICATION			
Neighborhood Preservation Projects - New	36	27	12
Continued from Prior Year	15	40	30
Mutual Housing Association Development Starts	0	1	1
Continued Developments from Prior Year	1	1	2

Table 7
NEIGHBORHOOD REINVESTMENT CORPORATION
PROGRAMMATIC COMPARISONS
FISCAL YEARS 1982-1984 - ALL SOURCES OF FUNDS
(amounts in thousands)

			FY 1982-1983			FY 1983-1984	
	FY 1982	FY 1983	Difference	% Change	FY 1984	Difference	% Change
NHS Development	$ 3,487	$ 3,378	$-109	-3.1	$ 3,207	$-171	-5.1
Programmatic Supplements	1,548	2,076	528	34.1	1,823	-253	-12.2
Training and Technical Services	6,145	6,348	203	3.3	5,835	-513	-8.1
TOTAL Neighborhood Housing Services	11,180	11,802	622	5.6	10,865	-937	-7.9
Apartment Improvement Program	765	776	11	1.4	841	65	8.4
Research and Pilot Replication	1,572	1,571	-1	-.1	1,144	-427	-27.2
General Administration	5,027	4,278	-749	-14.9	3,799	-479	-11.2
TOTAL All Programs	$18,544	$18,427	$-117	-.6	$16,649	$-1,778	-9.6

CLERK'S NOTE: Appendix A refers to Public Law 95-557, Housing and Community Development Amendments of 1978.

Appendix B

NEIGHBORHOOD REINVESTMENT CORPORATION
Program Report - December 31, 1982

The following Neighborhood Reinvestment programs are in operation or in development in neighborhoods in the cities listed below:

CITY	NEIGHBORHOOD HOUSING SERVICES PROGRAMS			NEIGHBORHOOD PRESERVATION PROJECTS	NEIGHBORHOOD PROGRAMS	
	Organized	In Development	In Expansion		Operational	In Development
Aberdeen, WA	1					
Albuquerque, NM	1					
Allentown, PA	1			1		
Anaheim, CA						
Anchorage, AK	1			1	AIP	
Arlington, VA						
Atlanta, GA	2					AIP
Aurora, IL	1			1	INS, COM	PPS PPS
Baltimore, MD	2					
Barberton, OH	2			3	ULT, PPS	
Beaumont, TX	1					
Beloit, WI	1					
Birmingham, AL	1			1		
Boise, ID	1		1			
Boston, MA	2					
Bridgeport, CT	2					
Buffalo, NY	6				PPS, INS	COM
Burton, MI	1					INS
Cambridge, MA		1				
Casper, WY	1					AIP
Cattaraugus County, NY	1					
Charleston, SC	1					
Charleston, WVA	1				PPS	
Charlotte, NC	1					

CITY	NEIGHBORHOOD HOUSING SERVICES PROGRAMS Organized	In Development	In Expansion	NEIGHBORHOOD PRESERVATION PROJECTS	NEIGHBORHOOD PROGRAMS Operational	In Development
Chattanooga, TN	1					
Chelsea, MA	2					PPS
Cheyenne, WY	1					
Chicago, IL	6			2	INS	ULT
Cincinnati, OH	3					
Clackamus County, OR		1				OBH
Clearwater, FL	1					PPS
Cleveland, OH	2		2		INS, PPS	AIP
Colorado Springs, CO	1			1		
Columbus, OH	2				PPS	
Cumberland, MD	1					
Dallas, TX	3				AIP	
Davenport, IA	1			2		
Denver, CO	1				PPS	
Des Moines, IA	2			1		INS
Detroit, MI	1		1			
Duluth, MN		1				
Durango, CO		1				
Durham, NC	1					OBH
East Orange, NJ					AIP	
East Providence, RI	1					
Elgin, IL	1					
Emeryville, CA	1					
Evansville, IN	1		1			
Fort Worth, TX	1			1		
Gainesville, FL	1					
Great Falls, MT	1				ECS	
Green Bay, WI	1					

CITY	NEIGHBORHOOD HOUSING SERVICES PROGRAMS			NEIGHBORHOOD PRESERVATION PROJECTS	NEIGHBORHOOD PROGRAMS	
	Organized	In Development	In Expansion		Operational	In Development
Hartford, CT	1		1		AIP, INS	OBH
Houston, TX		2				
Indianapolis, IN	3					
Inglewood, CA	1					
Ithaca, NY	1			3		
Jackson, MS	1					
Jacksonville, FL	1					
Jersey City, NJ	1			1		
Kalamazoo, MI	1					
Kankakee, IL	1					
Kansas City, KS	1					
Kansas City, MO	2			1	INS	COM
Kenosha, WI		1				
Knoxville, TN	1					
Lafayette, IN		1				
Lafayette, LA	1					
La Habra, CA	1			2		
Lakeland, FL	1					
Lawrence, MA	1					PPS
Little Rock, AR	1					
Los Angeles, CA		3			AIP	INS
Louisville, KY	1					
Macon, GA	1					
Menlo Park, CA	1					
Miami, FL	1					
Milwaukee, WI	2			1		
Minneapolis, MN	3				INS	AIP

CITY	NEIGHBORHOOD HOUSING SERVICES PROGRAMS			NEIGHBORHOOD PRESERVATION PROJECTS	NEIGHBORHOOD PROGRAMS	
	Organized	In Development	In Expansion		Operational	In Development
Montgomery County, MD						AIP
Mt. Vernon, NY					AIP	
Nashville, TN	2					OBH
Newark, NJ	1				AIP	PPS
New Britain, CT	1					
New Haven, CT	1			1		
New Orleans, LA	1		1			
New York, NY				2		
Bronx	2			1	AIP (2)	
Brooklyn	2					
Queens	2		1			AIP (2), PPS
Staten Island	1					
Niagara Falls, NY	1					COM
Norwalk, CT	1			1		
Oakland, CA	1			1	OBH	
Oklahoma City, OK	1					
Omaha, NE	1					
Orlando, FL	1					
Pasadena, CA	1					
Peoria, IL	1					
Philadelphia, PA	3				PPS	AIP
Phoenix, AZ	2			1		
Pittsburgh, PA	1		1		PPS	
Pontiac, MI	1					
Providence, RI	1					
Pueblo, CO	2					
Quincy, IL		1				
Quincy, MA	1			1		

CITY	NEIGHBORHOOD HOUSING SERVICES PROGRAMS			NEIGHBORHOOD PRESERVATION PROJECTS	NEIGHBORHOOD PROGRAMS	
	Organized	In Development	In Expansion		Operational	In Development
Reading, PA	1					
Richland Center, WI	1				PPS	
Richmond, CA	1					
Richmond, VA	1					
Rochester, NY	1		1			
Saginaw, MI	1				PPS, ECS	INS
St. Louis, MO	3			1		
St. Paul, MN	3				INS	
St. Petersburg, FL	1			1	INS	
Salt Lake City,UT	3					
San Antonio, TX	1			1		OBH
San Bernardino, CA	1					
San Diego, CA	1					
San Luis Obispo, CA				1		
Santa Ana, CA	1			1		
Savannah, GA	1			1		OBH
Scranton, PA	1					
Shreveport, LA	1					
South Bend, IN	1				PPS	
South Portland, ME	1					
Springfield, MA	1		1			
Springfield, OH	1		1			AIP, PPS
Spring Valley, NY				1		
Stamford, CT	1				AIP	
Syracuse, NY	1				PPS	
Tacoma, WA	1					
Tampa, FL	2					
Toledo, OH	2			1		
Trenton, NJ	1					
Tucson, AZ	1					
Tulsa, OK	1			1		PPS
				1		

CITY	NEIGHBORHOOD HOUSING SERVICES PROGRAMS			NEIGHBORHOOD PRESERVATION PROJECTS	NEIGHBORHOOD PROGRAMS	
	Organized	In Development	In Expansion		Operational	In Development
Union County, NJ	3					
Utica, NY	1					
Vallejo, CA	1					
Vermont-Rural		1				
Washington, DC	2					
Waterbury, CT	1				AIP	
Waterloo, IA	1					
West Palm Beach, FL	1					
Wilmington, NC	1					
Winston-Salem, NC	1					
Yonkers, NY					AIP (2)	
New Jersey NHS Foundation					SWF	
TOTAL	129 Cities 178 Neighborhoods	13	12	40	40	32

Neighborhood Programs: PPS - Problem Property Strategies (includes Home Ownership Promotion and Rehabilitation and Sale Programs; AIP - Apartment Improvement Program; SWF - State Wide NHS Foundation; INS - Insurance Industry Full Partnership; OBH - Owner-Built Housing Program; ECS - Energy Conservation Services; COM - Commercial Revitalization; ULT - Urban Lender Training.

Appendix C-1

NEIGHBORHOOD HOUSING SERVICES MODEL

The Neighborhood Housing Services (NHS) program is a comprehensive coordinated reinvestment strategy to produce neighborhood revitalization for the benefit of current residents. This strategy, carried out by a partnership of neighborhood residents, business and financial leaders, and local government officials, systematically improves housing and upgrades neighborhood amenities. The goal of NHS is to exert a long-term stabilizing influence on a neighborhood, reversing decline, and reducing risk for lenders, insurers, and others doing business in the neighborhood.

For this strategy to have the desired long-term results, and for there to be a renewal of confidence, an improved quality of life must be perceived in the neighborhood by the residents and by the larger community. This perception reverses the weak demand factors which contribute to the disinvestment and brings about a strengthened real estate market. Success or "completion" is therefore measured in terms of that perception and the ability of the neighborhood to sustain a stable community standard of maintenance.

To accomplish this goal the program has the following basic components and services:

Private/Independent: Funding for the operating budget is provided by participating financial and business organizations. Government funds are contributed to the revolving loan fund and in some cases have been contributed as a portion of the operating funds. Strong efforts are made to ensure that government funding does not damage the private character of the program through disproportionate control of the program.

Nonprofit Corporation: NHS programs are incorporated under the 501(c)(3) tax-exempt charitable status. No stock or profit accrues to its members.

Locally Controlled: The NHS program is governed by a local board of directors made up of neighborhood residents, at-large community members, private sector representatives, and city government representation or liaison. NHS is not a government controlled program. Neighborhood Reinvestment input is through monitoring and the provision of technical assistance by invitation of the local board of directors.

Designated Neighborhood: The NHS operates in a neighborhood with defined boundaries characterized by: (a) a housing stock showing evidence of deterioration and lack of maintenance; (b) an inadequate degree of mortgage and home improvement activities; (c) a substantial degree of homeownership; (d) an income mix in the neighborhood as low as resources will permit (very low family incomes and high repair costs will require raising additional resources for revolving loan funds and staffing); and (e) a neighborhood which, for example, may contain 500-2,000 units. Multiple neighborhoods are encouraged where resources can be raised to adequately serve each neighborhood.

Numerical Majority of Residents on Board: The partnership relationship must be carried out in the board and committee structure. No partner controls, but neighborhood residents constitute a numerical majority of the board. Broad-based community representation may enhance the ability to allow expansion to other neighborhoods. Care should be taken to keep private sector participation substantial enough that a true partnership is in effect. Local government participation is by board membership and/or meaningful committee participation.

Working Board: The NHS board manages the affairs of the corporation. It accepts and carries out the ongoing responsibility for keeping in place the resources necessary to operate the NHS program including loan fund and operating budget funding. Other responsibilities include assuring proper financial management, designating target areas, reaching agreements with local government on appropriate code inspection services and public improvements, working with lenders to insure the availability of bankable lending, maintaining a viable partnership including a strong level of organized resident participation, providing effective staffing, and designing creative strategies to accomplish particular neighborhood objectives. The board carries out those responsibilities through a committee structure.

Skilled and Committed Staff: NHS programs have operated with as few as three staff members; however, where resources have permitted it, programs have achieved greater momentum with a staff of four or more. The staff, under supervision of an executive director, implements activities mandated by the board of directors. The staff provides management support to the board of directors in its fund raising efforts and carries out necessary administrative and community relations functions.

Organized Resident Support: Organized resident support is provided by resident board members and by other organized neighborhood groups to stimulate strong resident participation in the program and create a positive improvement climate within the neighborhood.

Offices in the Neighborhoods: The NHS program is administered from offices in the designated neighborhoods.

Through a cooperative effort, the staff, board, and committees assure that the neighborhood residents receive the following services:

Financial Services: Financial counseling is offered with regard to a client's financial alternatives with referrals to financial institutions or other NHS loan resources as appropriate.

Bankable Lending: Financial institutions cooperate to provide mortgage and home improvement loans based upon sound underwriting criteria.

Revolving Loan Fund: NHS administers a loan fund to meet the needs of nonbankable NHS clients and to stimulate improvements which will promote neighborhood confidence. Loans are made at rates and terms which fit the borrower's ability to pay, with the loan secured by the property, usually a second deed of trust or mortgage. NHS counsels clients to solve payment difficulties. The loan fund is promoted as a self-help tool for the neighborhood and is a private source of loans, not grants, which are to be paid back to provide a continuing resource to the neighborhood(s).

Rehabilitation Counseling: NHS provides analyses of home repair needs, design assistance, cost estimates, work write-ups (specifications), and home repair counseling in relation to owner desires and code deficiencies.

Construction Monitoring: NHS provides on-site inspections of work in progress for NHS loan fund clients and as a service to NHS clients financing repairs through other resources. NHS serves as a communication link between contractors and residents.

Code Inspections: A sensitive, systematic, and comprehensive housing inspection program is key to program effectiveness. The inspections are aimed at achieving voluntary compliance with generally accepted health and safety standards, but are backed up with local legal authority. In order to implement this strongly recommended program component a city designates specific inspectors to work with the NHS.

Advocacy for Neighborhood Improvement: NHS concentrates on improving the quality of life for neighborhood residents. It is not merely a lending program. NHSs secure public and private resources for capital improvements and improving vacant dwelling units, commercial and multi-family structures, etc. The board of directors continuously evaluates NHS progress towards stabilizing the neighborhood, and may add new program components or expand services to additional areas. Normally, NHS will continue to provide some minimal level of services to the original neighborhood(s).

Neighborhood Reinvestment: The role of Neighborhood Reinvestment is to develop the partnership which forms the heart of the NHS. To maintain the strength and vitality of the program, Neighborhood Reinvestment offers a variety of services including on-site workshops and educational programs, specialized training programs for new NHS staff, educational conferences for NHS boards of directors and staffs, and technical assistance.

Appendix C-2

THE DEVELOPMENTAL PROCESS

Bringing an NHS program into existence involves creating a working partnership among disparate groups — groups which, before the NHS developmental process, more often than not exhibit some degree of hostility or lack of confidence in one another. Establishing positive relationships among business people, representatives of local government and neighborhood residents is the central thrust of the developmental process. The men and women on the program development staff of Neighborhood Reinvestment are trained in educational processes designed to "build bridges" between the partnership groups, enabling the three groups to discover the common ground on which each of their self-interests will be served and to provide them with the necessary information and understanding to develop an NHS program tailored to the needs of their local community.

The developmental process necessary to establish a new NHS usually takes between 9 and 12 months. The process begins with an application or expression of interest from a city government, a community group, a local financial institution, etc. In response to that inquiry, Neighborhood Reinvestment staff visit the city in order to assess the willingness of potential members of the partnership to commit their energies to the program.

Once Neighborhood Reinvestment staff are convinced that the potential commitments exist for the formation of an NHS, a field representative is assigned and a local coordinator is hired. The local coordinator, someone who is already familiar with the community, works with members of the potential partnership groups in preparation for a carefully designed set of workshops and committee tasks in which local participants develop working relationships and an important sense of joint authorship of the NHS.

The first workshop brings together business and financial leaders, city officials, and community leaders to learn in depth about NHS and commit themselves to establishing a program. An affirmative decision involves the following commitments:

- All partners agree to serve on committees for the remainder of the developmental process and to actively participate in the affairs of the NHS once established.

- Business and financial leaders agree to make financial contributions in support of the NHS operating budget. Financial leaders agree to make home improvement and purchase loans to qualified NHS residents.

- Local government officials agree to make capital improvements and code inspections in the target neighborhood, cooperating with residents in identifying needs. Officials also commit to provide capital for a revolving loan fund for unbankable residents. In smaller communities with limited financial institution bases, the local government also may provide part of the NHS operating budget.

- Residents agree to actively participate in the program by improving their homes and neighborhoods in cooperation with the other two partners.

The remaining workshops involve selecting a target neighborhood, involving significant resident representation from the selected neighborhood, witnessing an operational NHS in another city, adopting by-laws for the new corporation, and electing a board of directors. The developmental process culminates with the hiring of staff and initiation of operations in the NHS neighborhood.

Although Neighborhood Reinvestment's formal role ends when program operations begin, training and technical services are provided to the board and staff upon request. Other types of support, including the provision of interim directors during transition periods, are also provided.

Attachment C-3

ESTIMATE OF THE TOTAL REINVESTMENT OCCURRING IN NEIGHBORHOOD HOUSING SERVICES PROGRAM NEIGHBORHOODS THROUGH FISCAL YEAR 1983

Support for Local NHS Program Activity

Contributions to developmental costs (primarily by local governments)		$ 5,741,000
Contributions to NHS operating budgets (primarily by financial institutions)		67,774,000
Contributions to NHS revolving loan funds (local government, Neighborhood Reinvestment Corporation, foundations, other industry)		52,631,000
Purchase of NHS Loans (by Neighborhood Housing Services of America)		11,000,000
City expenditures for code inspections		13,860,000
	TOTAL	$ 151,006,000

Reinvestment in NHS Neighborhoods*

Loans made through NHS loan funds		60,443,000
Loans made through financial institutions by referral from NHS		191,482,000
Loans made by city/state loan programs		28,103,000
New mortgages written in NHS neighborhoods		565,853,000
Other rehabilitation financed**		706,664,000
Capital improvements to NHS neighborhoods		151,496,000
	TOTAL	$1,704,041,000

Federal Investment

Federal funds expended or committed to date (Urban Reinvestment Task Force demonstration grants 1974-1979 of $23,625,000; FY 1980-1983 appropriations of $53,843,000)	$77,468,000

*Estimates are based on documented activity through December, 1982; data collected by Urban Systems Research and Engineering, Inc. under contract to HUD; and through sample data collected for a research report entitled, Neighborhood Partnerships in Action, Neighborhood Reinvestment Corporation, August, 1981. The full amount of reinvestment cannot, of course, be attributed to the presence of NHS as some level of reinvestment may occur even in the absence of a program. The neighborhoods when selected, however, are deficient in reinvestment activity.

**Work financed by individuals through savings or money borrowed independently from financial institutions.

Appendix C-4

DEMOGRAPHIC PROFILE FOR NHS NEIGHBORHOODS

CITY NAME	NEIGHBORHOOD NAME	POPULATION	% BLK	% HSP	% OTH	% OVER 65	MEDIAN INCOME	# UNITS	% OWNER OCCUPIED	MED VALUE SINGLE FAMILY
ABERDEEN, WA	NORTH & SOUTH ABERDEEN	1,990	0%	0%	2%	N/A	8,322	772	N/A	13,445
ALBUQUERQUE, NM	DOWNTOWN	6,000	0%	70%	0%	21%	5,653	1,500	58%	10,545
ALLENTOWN, PA	OLD ALLENTOWN PRES AREA	5,000	9%	0%	0%	21%	7,734	2,099	69%	8,000
ANCHORAGE, AK	SPENARD	5,782	2%	0%	14%	2%	35,763	3,525	44%	24,100
ATLANTA, GA	GRANT PARK	8,500	40%	0%	5%	15%	6,735	4,000	53%	10,545
ATLANTA, GA	WEST VIEW	3,746	83%	0%	0%	5%	7,936	3,057	63%	15,900
AURORA, IL	N.E. AURORA & OAK PARK	13,576	16%	25%	0%	11%	8,937	3,215	66%	16,350
BALTIMORE, MD	GOVANS-PEN LUCY	12,547	83%	0%	0%	20%	7,560	2,562	60%	7,000
BALTIMORE, MD	PATTERSON PARK	10,000	10%	0%	0%	20%	8,083	5,000	50%	7,000
BARBERTON, OH	CREEDMORE	1,050	0%	0%	0%	25%	10,300	850	50%	25,000
BARBERTON, OH	VAN HYNING	457	1%	[illegible]	[illegible]	19%	7,113	225	61%	21,500
BEAUMONT, TX	BEAUMONT	6,311	2%	5%	0%	N/A	19,947	2,001	60%	25,000
BELOIT, WI	MERRILL	2,900	55%	0%	0%	25%	12,400	725	63%	20,000
BIRMINGHAM, AL	BUSH HILLS	3,000	52%	0%	0%	5%	16,015	2,511	39%	25,000
BOISE, ID	VISTA	2,700	0%	4%	0%	21%	N/A	905	62%	N/A
BOSTON, MA	COLUMBIA-SAVIN HILL	26,363	13%	0%	0%	20%	8,585	8,620	87%	14,285
BOSTON, MA	MISSION HILL	16,020	15%	0%	0%	15%	7,397	4,995	33%	15,370
BRIDGEPORT, CT	SOUTH END	10,000	24%	26%	0%	4%	5,903	659	63%	10,000
BRIDGEPORT, CT	UPPER EAST SIDE	13,301	10%	50%	0%	N/A	N/A	5,250	67%	10,400
BUFFALO, NY	BLACK ROCK-RIVERSIDE	19,700	1%	0%	0%	13%	8,500	4,000	85%	15,750

CITY NAME	NEIGHBORHOOD NAME	POPULATION	% BLK	% HSP	% OTH	% OVER 65	MEDIAN INCOME	# UNITS	% OWNER OCCUPIED	MED VALUE SINGLE FAMILY
BUFFALO, NY	BROADWAY-FILLMORE	6,275	25%	0%	0%	36%	11,400	2,735	46%	8,050
BUFFALO, NY	KEN BAILEY/DELAVAN	7,110	33%	0%	0%	16%	10,396	6,816	60%	13,335
BUFFALO, NY	MASTEN	15,673	99%	0%	0%	9%	12,000	4,956	41%	10,950
BUFFALO, NY	SOUTH BUFFALO	11,603	1%	0%	0%	10%	13,300	4,060	58%	13,150
BUFFALO, NY	WEST SIDE	6,565	5%	0%	0%	12%	7,204	2,596	69%	10,450
BURTON, MI	BENDLE	4,097	0%	2%	0%	30%	14,956	2,500	76%	20,000
CASPER, WY	SHERIDAN HEIGHTS	4,500	1%	0%	0%	N/A	N/A	1,500	70%	N/A
CATTARAUGUS COUNTY, NY	CATTARAUGUS COUNTY	85,697	1%	0%	2%	13%	16,091	34,051	62%	20,000
CHARLESTON, SC	GADSEN GREEN	4,077	99%	0%	0%	9%	5,411	914	57%	11,700
CHARLESTON, WVA	LOWER WESTSIDE	4,550	40%	0%	0%	20%	7,235	1,910	46%	10,000
CHARLOTTE, NC	PLAZA-MIDWOOD	3,040	10%	0%	0%	16%	11,900	1,078	63%	11,900
CHATTANOOGA, TN	GLENWOOD	4,000	75%	0%	0%	8%	7,244	1,228	83%	14,800
CHELSEA, MA	BELLINGHAM/SHURTLEFF	12,000	5%	35%	0%	45%	12,400	2,400	71%	8,000
CHELSEA, MA	CHELSEA	2,000	0%	5%	0%	14%	8,962	953	60%	13,600
CHEYENNE, WY	SOUTHSIDE	2,400	0%	45%	0%	60%	N/A	962	63%	32,000
CHICAGO, IL	CENTRAL AUSTIN	19,000	90%	0%	0%	25%	10,310	6,082	92%	16,025
CHICAGO, IL	HEART OF CHICAGO	23,000	0%	40%	0%	17%	9,000	3,000	75%	11,525
CHICAGO, IL	LITTLE VILLAGE	25,000	0%	75%	0%	9%	8,691	5,000	65%	14,400
CHICAGO, IL	NEAR NORTHWEST	20,620	2%	37%	2%	10%	9,390	8,609	30%	12,900
CHICAGO, IL	WEST ENGLEWOOD	16,000	95%	0%	0%	10%	7,500	3,000	85%	14,200
CHICAGO, IL	WEST HUMBOLDT	27,000	30%	40%	2%	20%	11,000	5,152	85%	34,000
CINCINNATI, OH	CARTHAGE	2,702	6%	0%	0%	10%	15,677	1,223	54%	29,439

CITY NAME	NEIGHBORHOOD NAME	POPULATION	% BLK	% HSP	% OTH	% OVER 65	MEDIAN INCOME	# UNITS	% OWNER OCCUPIED	MED VALUE SINGLE FAMILY
CINCINNATI, OH	EVANSTON	13,327	89%	0%	0%	20%	8,170	5,104	50%	14,075
CINCINNATI, OH	MADISONVILLE	13,734	45%	0%	0%	24%	8,072	4,996	55%	13,010
CLEARWATER, FL	SOUTH GREENWOOD	3,000	14%	0%	0%	30%	14,900	1,049	60%	12,350
CLEVELAND, OH	BUCKEYE	12,000	70%	0%	0%	15%	8,100	4,532	45%	10,000
CLEVELAND, OH	NEAR WEST SIDE	9,896	0%	20%	15%	7%	8,394	3,000	64%	11,530
COLORADO SPRINGS, CO	VERMIJO-CUCHARRAS	2,343	0%	16%	0%	9%	9,010	701	60%	8,000
COLUMBUS, OH	LINDEN	10,000	50%	0%	0%	7%	10,000	2,545	70%	16,000
COLUMBUS, OH	LIVINGSTON PARK	1,035	58%	0%	2%	0%	N/A	671	N/A	N/A
CUMBERLAND, MD	AREA II	1,919	4%	0%	0%	29%	N/A	1,120	30%	32,300
DALLAS, TX	MT AUBURN-SANTA FE-OWENWOOD	7.000	14%	0%	0%	21%	7.845	2.364	44%	10.767
DALLAS, TX	NORTH PARK/LOVE FIELD	7,662	77%	0%	0%	14%	7,969	2,574	57%	36,500
DALLAS, TX	TRINITY HEIGHTS	7,597	97%	0%	0%	6%	6,376	2,132	47%	10,400
DAVENPORT, IA	EAST VILLAGE	3,145	20%	0%	0%	15%	15,609	1,703	55%	22,000
DENVER, CO	HIGHLAND	6,721	1%	69%	0%	15%	10,234	2,700	63%	25,500
DES MOINES, IA	GREATER NORTHWEST	7,674	30%	6%	0%	N/A	12,600	3,500	21%	N/A
DES MOINES, IA	HARDING	3,500	5%	0%	0%	35%	10,500	1,025	81%	20,000
DETROIT, MI	HIGHLAND PARK	4,000	98%	0%	0%	5%	14,000	1,024	49%	14,300
DURHAM, NC	OLD NORTH DURHAM	3,000	45%	0%	0%	9%	9,239	599	50%	15,000
ELGIN, IL	NORTHEAST	14,616	12%	10%	0%	9%	12,655	5,610	43%	24,000
EMERYVILLE, CA	EMERYVILLE	300	60%	0%	10%	25%	12,140	57	65%	45,000
EVANSVILLE, IN	MAPLE GROVE (SWEETSER)	542	40%	0%	0%	13%	12,140	170	72%	17,000
FT. WORTH, TX	POLYTECHNIC	5,595	46%	14%	0%	17%	7,541	2,299	65%	15,000

CITY NAME	NEIGHBORHOOD NAME	POPULATION	% BLK	% HSP	% OTH	% OVER 65	MEDIAN INCOME	# UNITS	% OWNER OCCUPIED	MED VALUE SINGLE FAMILY
GAINESVILLE, FL	STEPHEN FOSTER	2,246	9%	3%	0%	N/A	N/A	950	10%	N/A
GREAT FALLS, MT	OLD TOWN	5,466	0%	0%	10%	32%	10,304	1,250	64%	30,000
GREEN BAY, WI	WEST SIDE	13,750	0%	0%	4%	0%	8,500	3,240	63%	N/A
HARTFORD, CT	BLUE HILLS	4,200	80%	3%	0%	9%	9.600	1,200	50%	20,750
INDIANAPOLIS, IN	BUTLER-TARKINGTON	5,080	80%	0%	0%	10%	10,462	2,027	53%	21,900
INDIANAPOLIS, IN	EASTSIDE/HOLY CROSS WESTMINSTE	9,244	9%	0%	0%	9%	6,270	3,355	0%	6,600
INDIANAPOLIS, IN	NORTHSIDE	12,009	77%	2%	1%	15%	8,569	5,110	24%	11,200
INGLEWOOD, CA	LOCKHAVEN	7,712	56%	24%	0%	0%	10,217	2,300	56%	22,600
ITHACA, NY	SOUTHSIDE	5,424	25%	0%	0%	17%	N/A	2,397	31%	28,409
JACKSON, MS	WEST JACKSON	1,500	70%	0%	0%	23%	14,000	690	80%	N/A
JACKSONVILLE, FL	SPRINGFIELD	4,519	40%	0%	0%	12%	3,720	1,970	40%	7,000
JERSEY CITY, NJ	HEIGHTS	43,000	0%	4%	0%	N/A	N/A	10,105	31%	N/A
KALAMAZOO, MI	EASTSIDE I	2,901	1%	93%	5%	N/A	14,194	990	46%	N/A
KANKAKEE, IL	UPPER RIVERVIEW	8,500	25%	0%	0%	N/A	N/A	1,500	54%	N/A
KANSAS CITY, KS	PRESCOTT	4,335	6%	0%	0%	N/A	8,529	2,486	55%	8,500
KANSAS CITY, MO	49-63 (EASTERN)	4,400	25%	0%	0%	30%	9,530	1,650	60%	12,200
KANSAS CITY, MO	CENTER CITY/SOUTH HYDE PARK	6,250	36%	0%	0%	21%	7,900	2,050	50%	12,000
KNOXVILLE, TN	PARK CITY	3,247	49%	0%	0%	19%	5,852	1,445	45%	8,500
LA HABRA, CA	LA HABRA	8,419	0%	39%	25%	11%	N/A	2,042	44%	19,600
LAFAYETTE, LA	RUFUS PECK-MONROE-ST. ANTOINE	5,429	66%	0%	0%	9%	4,992	1,753	53%	28,000
LAKELAND, FL	DIXIELAND	1,000	0%	2%	0%	0%	10,278	1,000	51%	N/A
LAWRENCE, MA	ARLINGTON	10,000	0%	60%	0%	10%	10,011	2,400	73%	20,000

CITY NAME	NEIGHBORHOOD NAME	POPULATION	% BLK	% HSP	% OTH	% OVER 65	MEDIAN INCOME	# UNITS	% OWNER OCCUPIED	MED VALUE SINGLE FAMILY
LITTLE ROCK, AR	CENTRAL LITTLE ROCK	8,000	55%	0%	0%	17%	6,500	2,000	50%	12,700
LOUISVILLE, KY	SHAWNEE	4,000	80%	0%	0%	9%	7,906	2,300	60%	12,100
MACON, GA	MONTPELIER	5,304	80%	0%	0%	10%	5,979	1,768	40%	25,000
MENLO PARK, CA	BELLEHAVEN	4,656	95%	3%	0%	N/A	7,656	1,348	54%	N/A
MIAMI, FL	WEST LITTLE RIVER	7,955	95%	0%	0%	6%	12,600	2,096	57%	15,523
MILWAUKEE, WI	NORTH SIDE	12,226	90%	0%	0%	10%	7,700	3,624	54%	10,067
MILWAUKEE, WI	SOUTHSIDE	13,036	1%	42%	5%	10%	7,944	4,729	35%	24,605
MINNEAPOLIS, MN	NORTHSIDE - WILLARD/HOMEWOOD	7,570	50%	0%	0%	N/A	9,500	2,250	74%	40,000
MINNEAPOLIS, MN	REGINA	2,000	60%	0%	0%	N/A	9,000	940	87%	17,100
MINNEAPOLIS, MN	SOUTHSIDE	6,306	50%	0%	2%	14%	9,000	3,625	72%	42,000
NASHVILLE, TN	INGLEWOOD	5,453	70%	0%	0%	8%	11,500	1,040	50%	11,100
NASHVILLE, TN	WAVERLY-BELMONT-HILLSBORO	3,485	65%	0%	0%	11%	8,210	1,190	37%	14,300
NEW BRITAIN, CT	BROAD AND NEWBRITE	12,209	5%	50%	0%	8%	9,500	4,181	83%	33,000
NEW HAVEN, CT	UPPER STATE, DWIGHT/EDGEWOOD	13,993	9%	3%	0%	21%	8,200	5,300	57%	50,000
NEW ORLEANS, LA	BROADMOOR	7,407	60%	0%	0%	15%	15,320	1,471	34%	35,000
NEW YORK, NY	BAISLEY PARK (JAMAICA)	7,163	95%	0%	0%	22%	10,000	3,305	67%	29,300
NEW YORK, NY	EAST FLATBUSH (BROOKLYN)	44,000	70%	7%	2%	N/A	11,405	5,752	50%	N/A
NEW YORK, NY	KENSINGTON/WINDSOR (BROOKLYN)	41,344	8%	14%	1%	N/A	10,836	4,105	87%	N/A
NEW YORK, NY	LAURELTON (QUEENS)	14,017	88%	0%	0%	N/A	12,519	5,131	77%	N/A
NEW YORK, NY	SOUNDVIEW (BRONX)	55,351	46%	0%	27%	N/A	10,527	2,697	50%	N/A
NEW YORK, NY	WEST BRIGHTON (STATEN ISLAND)	21,290	19%	0%	2%	N/A	11,430	2,537	56%	N/A
NEW YORK, NY	WILLIAMSBRIDGE (BRONX)	37,300	48%	0%	0%	N/A	10,649	5,490	N/A	N/A

CITY NAME	NEIGHBORHOOD NAME	POPULATION	% BLK	% HSP	% OTH	% OVER 65	MEDIAN INCOME	# UNITS	% OWNER OCCUPIED	MED VALUE SINGLE FAMILY
NEWARK, NJ	WEEQUAHIC PARK	17,929	93%	0%	0%	14%	8,689	6,499	51%	20,075
NIAGARA FALLS, NY	AREA 4	8,000	12%	0%	0%	30%	8,548	2,557	61%	13,250
NORWALK, CT	SOUTH NORWALK	8,012	27%	23%	0%	N/A	12,507	1,904	54%	25,000
OAKLAND, CA	ELMHURST	16,329	85%	0%	0%	17%	8,193	8,500	55%	10,125
OKLAHOMA CITY, OK	CAPITAL HILL	7,753	1%	15%	10%	35%	12,867	1,218	58%	28,500
OMAHA, NE	HOLY NAME PARISH	7,500	67%	0%	0%	N/A	16,500	2,728	69%	N/A
ORLANDO, FL	DELANEY	3,000	9%	0%	0%	40%	11,500	1,000	75%	N/A
PASADENA, CA	N W PASADENA	5,038	85%	0%	13%	8%	7,935	2,300	66%	17,034
PEORIA, IL	WEST BLUFF	8,855	3%	0%	0%	10%	14,300	3,319	66%	16,700
PHILADELPHIA, PA	ALLEGHENY WEST	13,130	85%	0%	0%	13%	7,769	3,520	71%	6,740
PHILADELPHIA, PA	EAST FRANKFORD	12,016	21%	0%	0%	27%	8,523	5,510	56%	7,058
PHILADELPHIA, PA	SOUTHWEST PHILADELPHIA	5,347	1%	1%	0%	15%	9,765	1,615	73%	8,400
PHOENIX, AZ	PHOENIX	5,000	13%	0%	0%	10%	8,221	1,697	57%	12,200
PHOENIX, AZ	PHOENIX II	6,831	3%	22%	0%	N/A	6,638	2,774	40%	11,000
PITTSBURGH, PA	CENTRAL NORTHSIDE	7,303	50%	0%	0%	32%	5,930	656	27%	7,010
PONTIAC, MI	PONTIAC	3,000	97%	0%	0%	7%	15,430	2,100	71%	25,000
PROVIDENCE, RI	ELMWOOD	14,456	7%	33%	0%	20%	8,900	3,500	24%	12,000
PUEBLO, CO	EAST SIDE	3,756	1%	47%	0%	26%	14,943	1,283	75%	10,200
PUEBLO, CO	MINNEQUA HEIGHTS	4,213	0%	35%	0%	8%	8,900	1,657	79%	18,000
QUINCY, MA	SOUTHWEST	6,560	1%	0%	0%	15%	10,524	2,860	42%	35,000
READING, PA	WARD 6	2,603	55%	35%	0%	16%	5,700	945	63%	6,400
RICHLAND CENTER, WI	RICHLAND CENTER	4,997	1%	1%	0%	21%	17,639	2,196	95%	34,000

CITY NAME	NEIGHBORHOOD NAME	POPULATION	% BLK	% HSP	% OTH	% OVER 65	MEDIAN INCOME	# UNITS	% OWNER OCCUPIED	MED VALUE SINGLE FAMILY
RICHMOND, CA	S-SIDE:CORTEX,CORONADO,SANTAFE	5,840	92%	4%	0%	5%	6,539	2,043	50%	17,100
RICHMOND, VA	NORTHSIDE	3,896	99%	0%	0%	14%	9,036	920	74%	14,900
RIVERSIDE, RI	RIVERSIDE	6,845	3%	0%	0%	12%	9,080	2,660	65%	14,000
ROCHESTER, NY	BROWN SQUARE/EDGERTON	11,000	5%	0%	0%	12%	10,000	4,310	44%	12,733
SAGINAW, MI	CENTRAL EAST	11,509	50%	0%	0%	11%	7,796	4,003	49%	11,100
SALT LAKE CITY, UT	CENTRAL EAST	3,700	1%	0%	0%	15%	8,729	3,268	66%	14,900
SALT LAKE CITY, UT	FAR WEST	5,703	3%	15%	13%	N/A	8,376	N/A	66%	N/A
SALT LAKE CITY, UT	WEST SIDE	3,420	3%	23%	22%	N/A	6,077	3,041	64%	N/A
SAN ANTONIO, TX	WEST SIDE	10,700	0%	98%	0%	17%	4,306	2,914	41%	7,100
SAN BERNARDINO, CA	CT 47-48	8,700	30%	70%	0%	9%	6,215	2,300	50%	10,500
SAN DIEGO, CA	CITY HEIGHTS (MID CITY)	5,508	10%	10%	16%	23%	3,120	2,435	23%	30,765
SANTA ANA, CA	ARTESIA/PILAR	3,973	0%	70%	4%	5%	12,580	1,259	72%	10,900
SAVANNAH, GA	BALDWIN PARK	2,349	60%	0%	0%	19%	10,241	1,041	57%	10,000
SCRANTON, PA	HILL SECTION	4,600	5%	0%	0%	25%	10,000	1,344	50%	35,000
SHREVEPORT, LA	QUEENSBOROUGH	3,000	90%	0%	0%	17%	7,796	1,000	63%	28,800
SOUTH BEND, IN	NEAR NORTHWEST	5,922	6%	6%	0%	22%	10,000	3,664	55%	10,500
SOUTH PORTLAND, ME	FERRY VILLAGE	2,500	0%	0%	0%	9%	8,136	769	66%	11,200
SPRINGFIELD, MA	UPPER HILL	10,000	70%	0%	0%	15%	8,819	2,525	60%	22,000
SPRINGFIELD, OH	SOUTH CENTRAL	3,800	55%	0%	0%	14%	8,000	2,034	50%	10,500
ST. LOUIS, MO	BENTON PARK	11,065	99%	0%	0%	11%	6,676	5,121	19%	7,210
ST. LOUIS, MO	PEN ROSE-O'FALLON	21,764	98%	0%	0%	10%	13,648	6,472	53%	13,600
ST. LOUIS, MO	SOULARD	7,380	2%	0%	0%	15%	7,142	2,413	55%	7,000

CITY NAME	NEIGHBORHOOD NAME	POPULATION	% BLK	% HSP	% OTH	% OVER 65	MEDIAN INCOME	# UNITS	% OWNER OCCUPIED	MED VALUE. SINGLE FAMILY
ST. PAUL, MN	DAYTON'S BLUFF	19,035	0%	0%	1%	13%	13,000	6,017	55%	40,000
ST. PAUL, MN	MERRIAM PARK	13,000	1%	0%	1%	15%	10,002	4,921	70%	30,000
ST. PAUL, MN	WEST SIDE	16,000	2%	30%	2%	15%	14,297	5,516	83%	32,500
ST. PETERSBURG, FL	LASSING PARK	2,236	5%	0%	0%	41%	8,329	1.217	40%	10,145
STANFORD, CT	WEST SIDE/SOUTH END	3,010	70%	0%	0%	N/A	17,590	1,493	60%	N/A
SYRACUSE, NY	BRIGHTON	12,576	0%	35%	0%	13%	10,500	3,462	55%	12,067
TACOMA, WA	S TACOMAWAY	3,000	5%	0%	0%	7%	9,450	1,490	64%	13,500
TAMPA, FL	HYDE PARK	8,000	17%	6%	0%	25%	9,000	3,000	67%	12,200
TAMPA, FL	TAMPA HEIGHTS	4,500	50%	5%	0%	N/A	N/A	1,500	60%	N/A
TOLEDO, OH	HISTORIC SOUTH SIDE	9,531	0%	14%	0%	13%	8,064	3,333	51%	9,450
TOLEDO, OH	OLD WEST END	19,528	60%	0%	0%	12%	9,178	7,463	65%	12,200
TRENTON, NJ	WILBUR	6,282	50%	0%	0%	16%	8,219	2,046	71%	10,319
TUCSON, AZ	PUEBLO GARDENS	2,428	30%	34%	0%	11%	6,935	786	56%	10,900
TULSA, OK	N W CROSSROADS	6,496	60%	0%	0%	13%	5,248	2,512	70%	8,000
UNION COUNTY, NJ	LINDEN	4,435	76%	0%	0%	5%	9,760	1,330	55%	21,300
UNION COUNTY, NJ	RAHWAY	6,576	30%	0%	0%	11%	11,017	2,200	54%	20,500
UNION COUNTY, NJ	ROSELLE	5,700	66%	0%	0%	8%	10,047	1,596	61%	20,000
UTICA, NY	CORNHILL	13,214	60%	0%	0%	17%	8,702	2,322	65%	13,200
VALLEJO, CA	SOUTH VALLEJO	2,864	25%	0%	0%	8%	7,969	1,128	60%	16,100
WASHINGTON, DC	ANACOSTIA	16,130	91%	5%	0%	0%	7,679	10,172	11%	16,205
WASHINGTON, DC	BLMINGDALE/ECKNGTN/EDGEWD	7,700	95%	0%	0%	4%	8,550	3,446	74%	20,000
WATERBURY, CT	WILLOW PLAZA,CROWNBRK,NEW PAC	10,500	25%	5%	0%	N/A	8,637	3,500	80%	22,000

CITY NAME	NEIGHBORHOOD NAME	POPULATION	% BLK	% HSP	% OTH	% OVER 65	MEDIAN INCOME	# UNITS	% OWNER OCCUPIED	MED VALUE SINGLE FAMILY
WATERLOO, IA	MODIFIED THREE	5,345	60%	0%	0%	11%	8,973	1,525	75%	9,931
WEST PALM BEACH, FL	GARDEN DISTRICT	3,500	40%	10%	0%	11%	8,382	1,329	65%	30,250
WILMINGTON, NC	THE BOTTOMS	3,385	99%	0%	0%	26%	4,700	891	60%	7,000
WINSTON-SALEM, NC	GREENWAY	1,500	100%	0%	0%	25%	17,500	309	72%	25,000

Appendix D-1

PROBLEM PROPERTIES STRATEGIES

Program Goal

Problem Properties Strategies are designed to assist NHS programs in addressing "sticking points" which are beyond the scope of basic NHS services and financial resources. These Problem Properties vary among neighborhoods but frequently involve: vacant or abandoned houses; low percentages of homeownership and a significant number of poorly maintained rental properties; vacant lots; a lack of affordable quality rental housing; and small undermaintained buildings. Through the implementation of various problem property strategies, NHS programs with assistance from Neighborhood Reinvestment are able to address these sticking points:

- Assist potential owner-occupants in purchasing and rehabilitating vacant houses or blighted rental property.
- Promote confidence in target blocks as problem properties are treated.
- Improve the physical condition of target blocks.
- Generate and reinforce interest in NHS services by neighborhood residents.
- Stimulate private reinvestment and new conventional mortgages in the NHS community.

Methods of Achievement

The Rehabilitation and Sale Program allows a local NHS to purchase a vacant house, rehabilitate the home fully, and then resell the improved property to a homeowner. In some instances, a modest subsidy from the local government or other sources is needed to bring the price of the house down to the neighborhood market value.

Neighborhood Marketing efforts focus on a neighborhood marketing program to attract new owner-occupants for vacant or abandoned properties which may be too expensive for a neighborhood tenant to purchase and rehabilitate. The approach includes homeownership counseling, rehab assistance, and financing alternatives, and may also provide current homeowners with home maintenance training.

Tenant Conversion assists existing neighborhood residents in purchasing the home they presently rent or a nearby home in the NHS neighborhood. A tenant advisor assists families in finding homes to buy within the neighborhood and works with them to obtain financing and address rehabilitation needs. In city after city, NHS programs have discovered a large pool of stable renters with excellent rent payment records and the ability and desire to become homeowners with the help of NHS counseling and flexible financing. Using this approach, problem properties represented by undermaintained, absentee-owned properties can also be eliminated.

The principal participant groups and operational elements which may be selected for development of a Problem Properties Strategies program include the following:

- Neighborhood Residents agree to serve on committees which direct the program; stimulate the interest of others; identify menacing properties suitable for acquisition, rehabilitation and sale; assist in locating owners of vacant buildings; watch homes during reconstruction to reduce vandalism; market properties to prospective purchasers; encourage neighbors to improve their properties; and work to obtain public improvements in the program area.

- Financial Institution Representatives agree to serve on committees which direct the program; contribute their technical expertise as an equal partner in the program; provide construction and permanent financing; convey institution-held properties to speed their rehabilitation and sale; and assist when appropriate in obtaining necessary insurance.
- Local Government Representatives agree to provide diagnostic housing and building inspections; acquire properties and/or convey government-held dwellings to speed rehabilitation and sale; consider forgiving back taxes to make acquisition feasible; provide public improvements to the target area; consider underwriting partial operating costs for the program; and subsidize capital outlays to ensure sale of homes at neighborhood market values.
- Technical Staff administer the process; carry out the goals of the Problem Properties Strategies program partnership; and manage the program.
- Realtors agree to market vacant properties, coordinating their efforts with lending institutions, the city, and the NHS staff.
- NHS Revolving Loan Fund is made available to unbankable clients who wish to purchase and/or rehabilitate previously vacant or rental houses.

Accomplishments

During FY 1983, five Problem Properties Strategies programs will have been initiated.

As a result of the Prudential's social investment of $5 million in the national NHS secondary market, administered by NHSA, NHSs now have access to low interest money for first mortgages. This resource is enabling NHSs to overcome "sticking points" in their neighborhood revitalization strategies.

Impact

NHSs with Problem Properties Strategies which focus on rental conversion to home ownership have converted and rehabilitated an average of 20 to 25 houses per neighborhood, with an average total value of about $418,000. Throughout the program, 40 to 75 potential new homeowners are counseled.

NHSs with strategies which focus on rehabilitation and sale of vacant houses have averaged about 6 houses per neighborhood, with an average per year total value of $180,000. Directly related spin-off reinvestment by residents in target areas is evident but cannot be separated from the overall impact of the NHS.

Appendix D-2

INSURANCE INDUSTRY FULL PARTNERSHIP PROGRAM

Program Goal

The Insurance Industry Full Partnership Program was developed in response to difficulties NHS residents were having in securing voluntary insurance and the impact this was having on the NHSs' ability to rebuild confidence in their neighborhoods. The Insurance Industry Full Partnership Program is designed to strengthen the delivery of voluntary residential insurance services in the neighborhood as well as involve the local insurance industry in the financial and managerial support of the NHS at a level comparable to that of the banks and savings and loans.

Methods of Achievement

Creation of an NHS-Insurance Industry Full Partnership Program entails 9 months of workshop and committee work. This process brings together, usually for the first time, senior company officers, local company underwriters, agents, residents, lenders, city representatives, and NHS staff. For most insurance representatives it is often the first time they actually walk through the neighborhood or develop a sense of what happens when a neighborhood begins to turn around. Usually it is the first time a city code official and an underwriting manager have the opportunity to discuss and recognize the similarity between company underwriting criteria and city code requirements. And for residents, it is the first time they have been given detailed information concerning industry operations, structure, and limitations—which provides an important base for their participation for developing new products, marketing strategies, and adaptation of eligibility criteria. Through service on committees, the groups work together to develop specific proposals concerning:

- How the delivery system can be strengthened in order to assure residents access to, and service by agents;
- The need for additional forms of insurance coverage which would be responsive to residents' needs;
- In light of NHS efforts, the criteria which need to be met in order to be eligible for particular forms of coverage;
- The roles NHS can play in facilitating education/communication among companies, agents, and residents; and
- The level of financial and management support the industry can provide to the NHS's operation.

Based upon the development of this pilot project in Chicago and replication in seven additional cities, we have found the basic components of this program to be:

- An in-house NHS Insurance Coordinator who provides outreach, one-on-one counseling to residents, assistance throughout the process of securing coverage through the voluntary market and/or claim settlement and in reducing the need for the Fair Plan in the NHS neighborhood;
- Company communications to their underwriters and agents regarding their desire to service NHS neighborhoods;

- A list of agents who are familiar with the neighborhood and want to and are able to provide good service;
- Company liaisons who know the neighborhood and can assist in the placement of insurance should any difficulties arise;
- The availability of a full range of coverages by standard carriers which will respond to the needs of NHS residents;
- Recognition of the similarity between general industry underwriting criteria and city code and that homes which are up to code will in most cases meet general industry underwriting criteria;
- Industry representation on the NHS board and committees; and
- Industry participation in the financial support of the NHS at a level comparable to that being provided by the banks and savings and loans.

Impact

In the past four years, as a result of their participation in the creation of NHS Insurance Industry Full Partnership programs, a number of companies have developed and tested new forms of coverage to address the insurance needs of urban homeowners such as: properties with a substantial discrepancy between market and replacement values; sound properties adjacent to vacant and/or poorly maintained rental buildings; and vacant properties undergoing substantial rehabilitation. The NHS strategy of coordinated reinvestment on a block-by-block approach has provided companies with the environment in which they can test these coverages.

The companies' commitment to NHS is also reflected in financial investments in NHS partnerships in the form of contributions and social investments. Company contributions to NHS Full Partnership programs have totalled over $1.8 million to date.

These industry-wide contributions have enabled the eight local Insurance Full Partnership programs to enhance services in their neighborhoods, and special challenge grants from the St. Paul Companies and Allstate have allowed the Twin Cities and Chicago NHSs to expand their programs to additional neighborhoods. Equitable, Prudential, Allstate and Aetna Life & Casualty have also recognized that the NHS neighborhood offers sound investment opportunities and have made significant commitments to NHSs through social investments in the NHS secondary market, administered by NHSA.

Appendix D-3

OWNER-BUILT HOUSING PROGRAM

Program Goal

The program addresses the severe shortage of affordable, quality housing facing moderate income families. Based on a rural self-help model, this new program enlarges homeownership opportunity in NHS neighborhoods by families collectively building their own homes, with supervision, coordination, and technical assistance provided by the NHS. The initial demonstration project in the NHS neighborhood in Oakland, California was developed in 1980. It consisted of 14 families who invested 40 hours of work per week per family for a period of nearly a year. This investment has enabled each family to take title to a conventionally-financed home with an estimated market value of over $85,000 by assuming a $43,000 mortgage.

Methods of Achievement

The program was designed and has been implemented by the NHS in Oakland, California. The program progressed in the following manner:

- Development Phase — The NHS purchased contiguous lots from the city at a reduced cost, received commitments from lenders to assist in financing the construction, and prepared house plans.
- Pre-Construction Phase — The NHS marketed the program and selected participants based on income limits. Participants organized family associations and were provided construction training by the NHS. Lenders assisted in qualifying participants for loans.
- Construction Phase — The NHS provided construction supervision and inspection services to groups of families as they cooperatively built each of the 14 houses.
- Loan Closing — The NHS assisted in closing out the construction loans and securing permanent financing for the families so that they could immediately occupy their homes.

Accomplishments

This construction method of building single-family homes for about half the market value is being replicated in Santa Ana, California; Salt Lake City, Utah; Hartford, Connecticut; Nashville, Tennessee; and Clackamas County, Oregon; and has expanded to eight additional owner-built houses in Oakland being built.

Impact

The following table summarizes the direct impact of the Oakland NHS's Owner-Built Housing program:

Owner-Built Housing Fourteen Home Development	Per Unit	Total
Land and Improvements	$ 6,000	$ 84,000
Construction	31,000	434,000
Financing	$ 6,000	$ 84,000
TOTAL	$43,000	$ 602,000
Estimated Market Value	$85,000	$1,190,000
Savings to Owner-Builders*	$42,000	$ 588,000
Administrative Costs (covered by Neighborhood Reinvestment Grant)		$ 130,000

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*Equals Family Labor Equity Earned

Administrative costs in future Owner-Built developments are expected to be approximately 50% lower than in the pilot project. The leverage on Neighborhood Reinvestment's start-up assistance will continue to grow as future development is totally funded by local resources.

Appendix D-4

ENERGY CONSERVATION

Program Goals

The goals of the energy conservation program are to create model neighborhood energy conservation strategies which can then be replicated in other NHS and AIP neighborhoods.

Neighborhood Reinvestment has been working with several NHSs across the country in developing comprehensive and effective energy conservation programs to combat rising fuel and utility costs. With assistance from the Ford Foundation, the strategies developed, materials produced, and experience gained from the most promising models are being incorporated into "composite" models. These model strategies will be tested and refined this year through their replication in three NHS neighborhoods and two Apartment Improvement Programs.

Neighborhood Reinvestment is also increasing the quality and quantity of energy conservation in order to assure that energy conservation improvements are integrated into the rehabilitation and counseling services offered by the local NHSs. In addition, Neighborhood Reinvestment is now publishing a journal on energy conservation techniques and strategies to be utilized in rehabilitation by NHS and AIP programs.

Methods of Achievement

Neighborhood Reinvestment funded three programmatic approaches toward delivering energy conservation services to NHS residents:

- Elmwood NHS Energy Conservation Program (Providence, Rhode Island) The Providence Elmwood NHS is developing an energy conservation program that provides a comprehensive energy audit program and educational outreach. The energy audit will: (1) evaluate the effects of physical problems on energy consumption; (2) determine the effects of living patterns and habits on energy consumption; and, (3) analyze energy costs related to a building's cash flow. The educational outreach includes seminars, workshops, and working models demonstrating how various energy conservation measures can actually be used.

- Ferry Village NHS Energy Conservation Program (South Portland, Maine) Ferry Village NHS is systematically integrating energy conservation audit and repair procedures into its operations. Energy conservation is being tested as an alternative to sensitive code enforcement in marketing of the NHS's comprehensive rehabilitation services. In-home discussions and workshops for small groups of residents also demonstrate cost-effective do-it-yourself energy conservation techniques.

- Salt Lake City NHS Energy Conservation Program (Salt Lake City, Utah) Salt Lake City NHS is coordinating the full spectrum of existing energy conservation resources for its neighborhood. Partners with the NHS in this effort include: city and state governments, utility companies, schools, lending institutions, contractor trade associations, and community action programs. The comprehensive plan evolved in the NHS neighborhood will serve as a model for other neighborhoods in the city.

Based upon the success of these efforts, Neighborhood Reinvestment was awarded an energy conservation grant by the Ford Foundation to allow for an expansion of energy conservation efforts among NHS and AIP programs. The grant help to support energy conservation efforts by three NHSs and two AIPs as well as training programs at Neighborhood Reinvestment's Training Department. In addition, the grant contributed to the publication of Weathervane.

The NHS programs which shared in the Ford grant funds are in Chelsea, Massachusetts; Denver, Colorado; and Rochester, New York. In Chelsea, the NHS staff is working with property owners, managers, and renters in developing a model approach to integrate weatherization into both the rehabilitation and management of two- to six-flat buildings.

In Denver, the Highland NHS undertook a comprehensive weatherization project which focuses on training volunteer residents, predominantly senior citizens, as energy auditors. The residents will help market the program, do audits, and informally assist homeowners as they complete their energy conservation rehab.

In Rochester, two NHS rehab specialists were trained as energy auditors by the Rochester Gas and Electric Corporation. After training, they developed a plan to incorporate energy conservation into many aspects of the NHS rehab process. The NHS also organized an energy conservation committee with strong representation from utilities and various energy conservation groups.

AIP programs sharing in the Ford grant funds are in New York City's Northwest Bronx and Pelham Parkway areas. Projects in these two programs are integrating conservation techniques and materials into the rehabilitation and management of large buildings. Through AIP, New York City's rehab staff was helped to place more emphasis on energy conservation in work write-ups. Presently, the first rehab packages are being reviewed with lenders.

Neighborhood Reinvestment's Training Department used some of the Ford funds to establish model curricula and training in energy conservation for NHS executive directors and rehab specialists. The training for executive directors includes methods of increasing outreach services to the community, and the use of energy conservation as both a marketing tool for NHS programs and as a way of attracting other resources, such as utilities, to the partnership. The training for rehab specialists spans the need for energy conservation, the basics of technology and up-to-date product information, the cost effectiveness of low-cost and no-cost weatherization, and the conservation specialist's role as a community educator.

Appendix D-5

NEIGHBORHOOD COMMERCIAL MANAGEMENT PROGRAM

Program Goals

This program is designed to assure the viability of commercial corridors by strengthening small businesses, improving the physical environment of the area, and providing additional goods, services, and employment for the community. A Neighborhood Business Center is created which is a locally controlled partnership of merchants, commercial property owners, residents, lenders, and city officials and is intended to complement the work of NHS programs.

Methods of Achievement

Neighborhood Reinvestment has studied nine neighborhood commercial revitalization projects to draw out the best "eclectic" model from all of them and has worked intensively with groups in four cities — Baltimore, Chicago, Philadelphia, and Portland (Oregon) — to fine tune the model for dealing with the complex problems facing neighborhood business corridors. The model is based on a partnership approach, following the successful partnership process of the NHS program. This approach is based on the conviction that the residents, merchants, property owners, government, and lenders who do business in an area all share an interest in seeing the area remain a vital community asset. Key elements of the model are:

Neighborhood Businesses and Property Owners — In order to affect the change on a business corridor, the merchants and property owners must be willing to:

- develop a Neighborhood Business Center organization
- reinvest in their own businesses and properties
- plan and implement a joint advertising and promotion campaign
- establish design standards
- develop a long-range physical plan for the district
- establish a Special Assessment District

Community Representatives — In defining needed improvements, community representatives must be willing to:

- develop and support a Neighborhood Business Center organization
- provide input on merchandising, advertising, and promotion
- identify needed public improvements

Financial Institutions and Other Business Leaders — Representatives of financial institutions and other businesses contribute their time to serve on committees, offering sound business judgement for the benefit of the program. Representatives of financial institutions become involved in individual building analysis and also:

- restructure mortgages where necessary
- serve on a loan committee
- assist in identifying and/or financing new businesses
- help raise operating and revolving loan funds

The City — The city's role is one of coordination and funding. The city:

- increases capital improvements and services to the corridor

- helps to find a revolving loan fund for nonbankable business or real estate loans
- helps to develop and enforce design standards
- helps to develop and maintain a Special Assessment District
- helps to fund the development of the program

In order to make important decisions and manage staff, the partnership establishes a non-profit corporation with a specific description of purpose and by-laws. The board of directors of the corporation has the authority to hire and manage a staff which is headed by a Neighborhood Business Center manager who is responsible for advertising, promotions, community relations, sanitation, security, and maintenance. These functions must be performed continually and should be paid for by the business owners through an equitable assessment arrangement.

The Role of Neighborhood Reinvestment — Neighborhood Reinvestment acts as a catalyst to bring the partnership together and to develop the program. In doing so, Neighborhood Reinvestment:

- conducts a detailed market study of the business corridor to ascertain its potential
- enters into a development agreement with a local entity (ususally city government) to assist local merchants, property owners, residents, financial institution representatives, and representatives from local government in creating a Neighborhood Business Center
- conducts a careful survey of local resources and secures the interest of institutions and individuals concerned with neighborhood preservation
- hires and manages a temporary, full-time Neighborhood Business Center manager to immediately activate the program
- conducts an educational process featuring several workshops designed to acquaint representatives of all segments of the partnership with operational details of the program, and assists them in fitting the options to local needs
- assists in the organization of the partnership structure and selection of permanent staff for the program
- provides training and technical assistance to the program staff during the development phase and later stage of operation

Accomplishments

The model is currently being replicated/refined in the West End neighborhood of Atlanta, Georgia; the East Main Street neighborhood in Bridgeport,Connecticut; the Pine Avenue area of Niagara Falls, and Troost Avenue area of Kansas City.

Appendix E

TRAINING AND TECHNICAL SERVICES

Program Goal

The program goal of training and technical services provided NHS programs is to help local NHS programs become operational and to ensure their continued viability and effectiveness.

Methods of Achievement

These program goals are accomplished by providing ongoing local training and technical services program reviews; grants to support capitalization and operating expenses of a secondary market for low interest NHS loans operated by Neighborhood Housing Services of America (NHSA); formal training programs; on-site training; and educational conferences.

ONGOING TRAINING AND TECHNICAL SERVICES

Technical Services — local circumstances such as the loss of a staff member or limited financial resources can threaten the momentum of an NHS. When this occurs, the NHS may request technical services from Neighborhood Reinvestment. These services may come in many forms, ranging from assisting with bookkeeping or housing rehabilitation problems to conducting workshops on the operation of loan committees or providing a temporary executive director. By design, an NHS is an autonomous local private corporation. Although every NHS has the same basic focus of neighborhood revitalization, each program's partnership board has a unique composition, and thus has different strengths and weaknesses. This is equally true of the staff at each NHS. Because no two neighborhoods are the same, each NHS also faces somewhat different problems. To provide the range of technical services needed, without affecting the program's autonomy, requires a sensitive and highly flexible response from Neighborhood Reinvestment field staff.

Fund Raising Assistance — high construction costs and larger numbers of unbankable neighborhood borrowers have strained the capacity of individual local NHS revolving loan funds. This has, in turn intensified demand in the secondary market for NHS revolving loan fund loans, administered by Neighborhood Housing Services of America.

At the same time, there is a great deal of demand for NHS programs to expand into additional neighborhoods, and specific neighborhood needs require the use of additional programmatic tools in many neighborhoods. In order for NHS to pursue these expansions, both programmatic and geographic, additional operating funds are required for each local NHS program undertaking them. Traditionally NHS operating budgets have been contributed primarily by local financial institutions; however, the current difficult economic conditions for thrift institutions have reduced the ability of NHS programs to raise funds from this source. In addition, remaining sources of Federal assistance are subject to intensified local competition. As a result, a broader base of corporate support is required in most communities in order for NHS programs to maintain their services and undertake programmatic and geographic expansions.

Development of financial resources for NHS is a shared responsibility between Neighborhood Reinvestment and NHSA. NHSA has retained the firm of Marts & Lundy, Inc. as fund raising counsel and, with their assistance, we have undertaken a financial development effort to provide assistance to the NHSs in raising local operating budgets and in expanding the secondary market to meet the needs of NHS revolving loan funds in the 80s. (See Appendix H.) A major focus of Neighborhood Reinvestment field staff efforts has been in providing counseling and assistance to NHSs in preparing to undertake local fund raising campaigns within the corporate communities in their cities. Training and a fund raising guide were provided by NHSA to Neighborhood Reinvestment staff.

Emergency Reimbursable Grants — reimbursable grants are a new category of assistance to NHS programs. They are intended to be used sparingly in situations where an NHS is undertaking vigorous efforts to expand its base of contributions, but is experiencing a cash flow difficulty. When such conditions exist, which threaten the ability of a program to continue its work, Neighborhood Reinvestment can assist with a grant, some or all of which may be reimbursable, depending upon the success of the local fund raising effort. One-hundred-fifty-thousand dollars in such grants were made to five NHS programs in FY 1982, and $300,000 has been budgeted in FY 1983.

Neighborhood Strategies — neighborhood strategies involve helping the NHS board and neighborhood residents, block-by-block, set specific goals toward completing work in their neighborhood. This is a refinement on our earlier goal of "turning around" a neighborhood where our emphasis had been on changing the direction from decline to improvement. Today, as more and more neighborhoods are reaching the point of needing to decide just when the NHS will have achieved its goals and there is growing demand for NHS to serve additional neighborhoods, a finer tuning of what "completion" means is required. Through work with individual NHS programs, we have been able to assist NHSs in focusing on this concept and begin setting specific, attainable goals for completion in neighborhoods and sub-neighborhoods.

PROGRAM REVIEW

The purpose of a program review is to monitor NHS' progress and to facilitate a self-examination by the partnership of the NHS program. This is accomplished through meetings with the partners and working committees to discuss their roles, program activities, accomplishments, and challenges facing the NHS. The NHS is responsible for administering public funds in accordance with sound management principles and related contractual agreements. An evaluation of program management and service delivery systems is accomplished through a review of the lending, rehab, and fiscal management elements of the program.

SECONDARY MARKET SUPPORT

A significant element leading to the success of NHS programs is their continued ability to provide low interest loans for home improvements to homeowners who are unable to obtain financing through conventional means. This assistance is provided through a revolving loan fund. This loan fund is initially capitalized through a direct grant from Neighborhood Reinvestment to a new NHS, and by grants from the local governments, foundations, and corporations to the NHS. This loan fund has become particularly important in the high interest environment in which NHSs must now operate.

Revolving funds would soon be exhausted were there not a secondary market for the loans. This secondary market is provided through the financial operations of Neighborhood Housing Services of America (NHSA). Neighborhood Reinvestment in its support function provides capital to NHSA to purchase loans, subsidize interest rates and operate the secondary market. NHSA, in turn, sells securities backed by the loans purchased from local NHS programs to institutional investors at below market rates. (For a more detailed description of the operations of NHSA's secondary market, please see Appendix H.)

TRAINING FOR NEW DIRECTORS AND CONSTRUCTION SPECIALISTS

Training Programs — Neighborhood Reinvestment's NHS training department offers several intensive courses for new and prospective NHS staff members to ensure high quality, comprehensive training in organizing, managing, and providing technical services to NHS neighborhoods.

- Executive Director's Training Program — an extensive introduction for new executive directors to the operation of an NHS. This three-week course provides new executive directors with the wide range of skills and knowledge needed to manage a local nonprofit corporation. The course provides participants with a grounding in the philosophy and goals of NHS, leadership development, service delivery principles for voluntary organizations, and in day-to-day management skills. It also provides a general examination of the technical components of an NHS: revolving loan fund principles, appraisals and loan underwriting, conventional lending principles, construction monitoring, neighborhood strategies, and housing rehabilitation techniques.

- Construction Specialists Training Program — is an extensive introduction to the organization and management of the construction components of an NHS program. Geared to meet the specific needs of new NHS rehabilitation/construction specialists, the program includes working sessions on building inspections, specification writing, cost estimating, contractor supervision and construction payouts, and client/contractor relationships. The principles, operation and repair of mechanical systems (such as electric, plumbing and heating) are studied under the guidance of master tradesmen.

LOCAL PROGRAM STAFF & PARTNERSHIP TRAINING, CONFERENCES AND WORKSHOPS (EDUCATIONAL CONFERENCES)

On-Site Training — Neighborhood Reinvestment's field staff provides training tailored to meet the individual needs of each program. This assistance includes:

- NHS Executive Director Orientation — designed to provide a new director with a general overview of NHS operations and a recommendation for an individually-tailored self-education program which may include an internship in a savings and loan, a bank, or the city's code department. The orientation also assists the director in getting local operations underway and in acquiring job descriptions and other administrative materials developed by other NHS programs.

- Board of Directors Workshops — field staff also help the boards of newly-formed programs plan and conduct a workshop to formulate their committee structures, establish goals, and define the roles of board members and staff. Established boards may request a workshop as a structured forum in which to review their progress, set new goals using management-by-objectives techniques, or draw upon the experience of other programs to overcome a particular problem.

- Local Educational Workshops — as needed, members of the NHS partnership request assistance in conducting special workshops, e.g. to increase the involvement of local institutions which provide appraisals, loan underwriting, real estate services, construction, and mortgages. The workshops are designed to explain NHS goals and potential achievements to persons influencing the availability of resources and services in NHS neighborhoods.

Educational Workshops — each year, a number of special purpose conferences are held to enhance the delivery of quality services to NHS neighborhoods. These conferences are designed to augment present skills among NHS participants, and to introduce new ones. Additionally, they recognize the need of NHS participants to share experiences and knowledge with others working toward similar neighborhood goals.

The NHS Leadership Conference provides the leadership group of every NHS with the opportunity to focus on its program's own long-range planning and development and to discuss issues that affect the NHS network as a whole.

eld annually, the conference brings together four representatives from each HS program to discuss major policy and business issues. Each NHS is repreented at the national conference by a resident board member, a business or inancial board member and a city official (one of whom is the NHS board presdent), and the program's executive director.

NHS Annual Partnership Conferences are held on a regional basis to bring ogether representatives of every NHS partnership in that area for a full ange of technical workshops and seminars devoted to NHS operations. Planned y a committee of NHS partnership members, these educational experiences focus n such topics as neighborhood marketing, goal-setting, city and state resoures, and the relationships among the various NHS partners. The Partnership onferences are particularly important for newcomers to the NHS movement, providing both formal and informal settings at which NHS participants can share their experience and knowledge with others from cities within their region.

Residents' Conferences provide a strong vehicle for resident board members to share their experiences with colleagues from other programs within their region. Organized by residents on a regional basis, the conferences encourage information-sharing and discussions about the most effective ways of contributing to the NHS partnership. Formal conference sessions focus on specific regional issues, and such concerns as sensitive code enforcement, loan processing and community organizing.

Impact

It would be difficult to separate the impact of training, and technical services from that of NHS in general. Each NHS program has the potential to produce about two million dollars in neighborhood benefits per year. The investment in maintaining and strengthening the health and viability of existing NHS programs is extremely cost effective. The backing of Neighborhood Reinvestment's training and technical services is a significant resource for NHS programs that give them increased viability, compared to other nonprofit organizations carrying out community development activities.

Appendix F

APARTMENT IMPROVEMENT PROGRAM

Program Goal

The goal of the Apartment Improvement Program (AIP) is to revitalize and preserve neighborhoods with multi-family housing for the benefit of the current residents.

Methods of Achievement

The Apartment Improvement Program is based upon a partnership of property owners and managers, tenants, financial institutions, and the city. Through the use of the computerized Real Estate Investment Analysis Model a financial analysis of the current and projected operations of each building is studied. This model aids in the development of an individually tailored improvement plan through which each building may benefit from such activities as tenant participation, contemporary tax assessment reviews, and increased investment or restructured mortgages to improve the economic viability of the buildings and to finance improvements. Developed in Yonkers, New York, the Apartment Improvement Program in its first 36 months was able to "turn around" sixty-five apartment buildings containing 3,500 units.

Each of the above partners has a significant role to play in the apartment improvement process:

- o The city provides diagnostic building inspection and code enforcement; condemnation and demolition of selected buildings if appropriate; counseling assistance to existing and future tenants including Section 8 assistance if appropriate; public improvements and amenities; use of assessment and tax deferral programs; and, in many programs, implementation of the computerized investment analysis program and administration of the program.

- o Tenants and community representatives help define and plan improvements needed in buildings; develop and/or support creation of tenant organizations for ongoing communication with owners and managers; provide input regarding rent levels; and help maintain building standards.
- o Building owners and managers accept involvement of tenants and city officials in building analysis, make available all cash statements and financial information pertinent to the building, and respond positively to the need for improvements. Owners and managers are asked to cooperate in making needed improvements while following a financial plan which keeps rent prices as low as possible. In some cases, a change in management and/or ownership is required.
- • Financial institutions become involved in building analysis and to meet with the other partners; consider restructuring the mortgage; use the "good repair" clause or other legal means to encourage the improvement of buildings where owners are slow in responding; and assist in finding and/or financing new owners.

Accomplishments

AIPs will have been established in 22 communities by the end of FY 1983. These programs will have begun or completed work on more than 10,000 multifamily units. In each case, improvements in the building have been achieved through one or more of the following remedies:

- — restructuring the existing mortgage (amount, rate)
- — restructuring property income and expenses
- — improving services and financial counseling to existing or new tenants
- — generating a physical improvement program with code requirements as a minimum
- — reviewing real estate assessment and tax deferral benefits
- — municipal financing of capital improvements
- — restructuring property ownership and/or management
- — improving tenant counseling
- — improving tenant-landlord communications

Ongoing technical assistance is provided to all operating Apartment Improvement Programs. This includes training of all staff, workshops for the boards and committees, and special training on the use of the Computerized Real Estate Investment Analysis Model.

Impact

AIP programs to date have generated a total of approximately $24 million in conventional improvement loans and refinancing. Typically, an AIP will continue to take on additional buildings for improvement as long as the problem of deteriorating multi-family housing exists in the community to which AIP techniques can be applied. By the end of FY 1983, approximately $72 million in improvements will have been generated even at record high interest rates. Much more may be accomplished with more modest interest rates.

The impact study, Neighborhood Partnerships in Action, summarized:

> "The leverage of public resources in the AIP is extensive. To be conservative, private investment in the program will be considered to consist only of the value of improvements to a building. The value of time spent by volunteers on AIP business is not counted because it is difficult to estimate and varies from year to year. The present value of the subsidy provided by the differences between market and actual mortgage interest rates is not included because, in many cases, lenders do not have the option of getting out from under the building mortgages on terms comparable with those in the conventional market.
>
> "Public investment in the program consists of the direct costs of operating the program and the value of property taxes foregone if tax reductions have been granted. However, taxes foregone are not included as a cost of the program for reasons similar to those discussed above. Many properties that had taxes restructured were either in foreclosure at the time they entered the AIP or were making little or no profit. Tax reductions would have been sought and probably granted for these buildings, and taxes would have been lost to the city anyway.
>
> "In Yonkers, the average building received approximately $200,000 in improvements; the staff estimates that five buildings could be improved per year, which means privately financed annual program improvements would total $1 million. Assuming annual program operating costs of $125,000, each public dollar invested in the program is leveraged eight times. This computation is conservative; it does not take into account the additional private investment that occurs in surrounding properties and neighborhoods as AIP results are observed.
>
> "The leverage obtained in Mount Vernon is even higher. Total public costs (including money spent by Neighborhood Reinvestment and the city) amounted to $28,000, which produced $450,000 worth of private investment in Bailey Gardens. Therefore, each public dollar produced sixteen private dollars.
>
> "In Hartford, annual staffing costs are approximately $40,000. This funding produced $282,000 worth of private investment in the Sigourney Street project, and a leveraging of each public dollar by a factor of seven."

Appendix G

NEIGHBORHOOD PRESERVATION PROJECTS

Program Goal

Neighborhood Preservation Projects (NPP) selects and evaluates promising new program tools based on their addressing unmet neighborhood needs. The NPP process begins when an NHS or similar organization crafts a strategy to address one of these needs. Neighborhood Reinvestment selects a number of the most innovative solutions for grants and technical assistance. The projects generally serve a declining neighborhood and are on the modest scale appropriate to the NHS approach. The objective is to discover workable new neighborhood program tools and chronicle the particular experience so that it can be replicated in other neighborhoods.

Methods of Achievement

The goal of Neighborhood Preservation Projects (NPP) is achieved by a three-part process which includes:

1. Identification/Selection

   NPP searches for effective local strategies that can become useful program tools in other neighborhoods. In choosing projects to support, NPP uses the following criteria:

   - Meets a substantial need - Initially, the proposed project is analyzed to ensure that it meets an important and demonstrated need, and that the project will solve a local problem that has been identified by people working in the neighborhood.

   - Demonstrated capacity - The sponsoring organization must have operational experience and demonstrated capacity to conduct the project. This may be an NHS or similar community-based organization, or, in some cases, a local government working closely with a neighborhood association.

   - Partnership approach - The sponsoring organization must also have active participation by other neighborhood partners such as lenders, residents, merchants, and local government. In addition, local government should be willing to provide financial resources and technical assistance to the projects.

   - Provides information - The project must be capable of providing the practical information needed for Neighborhood Reinvestment to develop a workable demonstration project in other neighborhoods.

2. NPP Monitoring and Evaluation - Documenting Results

   Once promising projects are selected, NPP requires each project to collect and provide information which is monitored during the project and then evaluated at the end of the contract.

   - Monitoring - The original work program is the framework for observing the project. NPP periodically examines the following:

     -Structure - How the project is organized to do business.

-Operations - What activities are undertaken to reach the goal.

-Outputs - What has been accomplished, such as units rehabilitated, houses sold, tenants converted to owners, and increase in merchant sales.

NPP also gives technical assistance to projects which need help in meeting objectives.

- Evaluation - The reporting process and our technical assistance provide the necessary information to determine: (1) whether the program works; and (2) whether it can be replicated in other neighborhoods.

  -Does it work? - The project must clearly show that it meets a neighborhood need effectively and does it in a way that draws on the original partnership.

  -Is it replicable? - NPP must then determine whether the essential elements are broadly applicable in NHS neighborhoods. In order to make this judgment, we bring in other NHS neighborhood staff to discuss the use of the new program tool.

3. Packaging Model for Replication

The final step is to pull together all that has been learned into a format that fully describes the model and becomes the basis for pilot replication by the Neighborhood Program Development division. The information includes:

-a history of the program's development
-a description of the program's essential elements and time requirements for implementation
-a description of the partnership and the resource commitment level
-a description of the organizational form and staffing patterns
-a description of the target neighborhood and program impact.

This becomes the blueprint program model and instructional base for testing the new tool in other neighborhoods.

Accomplishments

All of the programmatic components now in the replication stage were originally successful Neighborhood Preservation Projects. These have included:

Apartment Improvement Program (AIP) - from the City of Yonkers (NY) Apartment Building Rehabilitation Project.

Neighborhood Conservation Services (NCS) - from the Berkeley (CA) Pilot Development and Marketing Project.

Problem Properties Strategies - from the Jamaica Plain (Boston, MA) Vacant Housing Renovation Project; City of Baltimore 26(h) Project; Pueblo (CO) NHS Rehab Training Project; Stop Wasting Abandoned Properties (Providence, RI) Project.

Statewide NHS Foundation - from the California NHS Foundation.

Owner-Built Housing - from the Elmhurst NHS (Oakland, CA) Owner-Built Housing Project.

Energy Conservation - from the Elmwood NHS (Providence, RI), Ferry Village NHS (South Portland, ME), and Salt Lake NHS (Salt Lake City, UT) Energy Conservation Projects.

Neighborhood Business Centers - from nine separate projects in the following cities: Toledo (OH), Cleveland (OH), Philadelphia (PA), Portland (OR), Baltimore (MD), Chicago (IL), Atlanta (GA), and Bridgeport (CT).

Home Ownership Promotion (HOP) - from the Baltimore NHS Home Ownership Development and Marketing Project (now part of Problem Properties Strategies).

NEIGHBORHOOD PRESERVATION PROJECTS
Currently Funded Demonstration Projects

NEW CONSTRUCTION IN OLDER NEIGHBORHOODS

Strategies to construct new single-family housing for current neighborhood residents.

- CHICAGO NHS/Infill Housing Project.
  (Chicago, Illinois)

- NEW HAVEN NHS/Infill Housing Project.
  (New Haven, Connecticut)

NEIGHBORHOOD RENTAL RESOURCES

Neighborhood-controlled rental resources involving rehabilitation, management and ongoing maintenance of properties to serve low- and moderate-income renters.

- BALTIMORE NHS/Neighborhood Rental Services (Baltimore, Maryland)

- ITHACA NHS/Rental Rehab Project (Ithaca, New York)

PROPERTY MANAGEMENT STRATEGIES

Property management services that stabilize apartment buildings by bringing sophisticated management, financial analysis and maintenance services to residents and owners.

- ANAHEIM AIP Property Owner&Tenant Multi-Family Management Project. (Anaheim, California)

- FLATBUSH Multi-Family Apartment Management Project. (Flatbush, New York)

ENERGY CONSERVATION

Programs integrating energy conservation techniques into neighborhood housing rehabilitation programs.

- ITHACA NHS/Super Energy-Efficient Rehab Project. (Ithaca, New York)

NEIGHBORHOOD YOUTH LEADERSHIP DEVELOPMENT & EMPLOYMENT TRAINING

Programs that provide employment training and leadership development opportunities for neighborhood youths.

- LA HABRA NHS/Student Involvement Project. (La Habra, California)

- SAGINAW NHS/Rehab Training Project. (Saginaw,Michigan)

- SALT LAKE NHS/Neighborhood Youth Project. (Salt Lake City, Utah)

ARSON PREVENTION

Mechanisms which prevent arson in apartment buildings.

- NORTHWEST BRONX Arson Prevention Project. (Bronx, New York)

NEIGHBORHOOD MAINTENANCE

A process whereby the NHS staff enhances the skills of residents so they can maintain the improvements generated by the NHS. The goal is to recreate a neighborhood that is self-maintained and to enable the NHS to concentrate on other areas needing improvements.

- BALTIMORE NHS/Neighborhood & Home Maintenance Project. (Baltimore, Maryland)

MICRO-COMPUTER MANAGEMENT SYSTEMS

A high-tech, cost-effective way to assist NHSs in all areas of operation. A process for introducing micro-computers to NHSs is being developed; key areas include bookkeeping, neighborhood data collection, financial planning and analysis, word processing, and construction monitoring.

- CHICAGO NHS/Computer Project. (Chicago, Illinois)

- FT. WORTH NHS/Computer Project. (Ft. Worth, Texas)

- ITHACA NHS/Computer Project. (Ithaca, New York)

- JERSEY CITY NHS/Computer Project. (Jersey City, New Jersey)

- KANSAS CITY NHS/Computer Project. (Kansas City, Missouri)

- NEW YORK CITY NHS/Computer Project. (New York, New York)

- PHOENIX NHS/Computer Project. (Phoenix, Arizona)

- QUINCY NHS/Computer Project. (Quincy, Massachusetts)

PROJECTS FOR RESIDENTIAL IMPROVEMENTS & DESIGNS FOR EXTERIORS (P.R.I.D.E.)

Low-cost, resident-initiated neighborhood projects that create visual improvements. Major objectives include generating increased resident involvement, creating a more visible public image, finding more local partners (i.e., paint stores, nurseries, hardware stores), and enhancing local fund raising efforts.

- ALBUQUERQUE NHS/Resource Development Project. (Albuquerque, New Mexico)

- ATLANTA NHS (GRANT PARK)Paint Grant & Erosion Control Project. (Atlanta,Georgia)

- BELOIT NHS/Neighborhood Video Training Project. (Beloit, Wisconsin)
- DES MOINES NHS/Voluntary Code Inspections Project. (Des Moines, Iowa)
- GOVANS NHS/PRIDE Project. (Baltimore, Maryland)
- LA HABRA NHS/PRIDE Project. (La Habra, California)
- MILWAUKEE NHS/Target Block Completion Project. (Milwaukee, Wisconsin)
- SANTA ANA NHS/PRIDE Project. (Santa Ana, California)
- SPRINGFIELD NHS/Block Club Organizing. (Springfield, Illinois)
- TAMPA NHS/PRIDE Project. (Tampa, Florida)
- TULSA NHS/Target Block Paint Project. (Tulsa, Oklahoma)
- WESTSIDE NHS/Exterior Landscaping Improvement Project. (St. Paul, Minnesota)

PROPERTY ACQUISITION STRATEGIES

Strategies to deal with the acquisition of buildings and parcels of land in a neighborhood setting for low- and moderate-income housing.

- CIVIC CENTER BARRIO Land Acquisition Project for Owner-Built Housing. (Santa Ana, California)
- SHREVEPORT NHS/Property Acquisition Project. (Shreveport, Louisiana)

MUTUAL SELF-HELP REHABILITATION

Self-help housing rehabilitation programs where groups of homeowners pool their labor to repair their homes.

- OAKLAND NHS/Mutual Self-Help Rehab Project. (Oakland, California)
- PEOPLE'S SELF-HELP HOUSING CORPORATION Mutual Self-Help Rehab Project. (San Luis Obispo, California)

HOMEOWNER REHABILITATION FINANCING STRATEGIES

Strategies that lower the cost of financing rehabilitation for homeowners.

- DAVENPORT NHS/Interest Subsidy Project. (Davenport, Iowa)
- SAN DIEGO NHS/Reverse Annuity Mortgage Project. (San Diego,California)

CRIME PREVENTION STRATEGIES

This strategy involves a close working relationship with the police. The local cable TV station will teach the NHS and residents how to prepare educational programs for neighborhood residents. This project will organize residents, reduce neighborhood crime and improve the quality of the neighborhoods.

- o TUCSON NHS/Crime Prevention Project. (Tucson, Arizona)

MARKETING STRATEGIES

A process that involves reassessment of the needs of neighborhood residents, corporate leaders and local merchants to better match NHS services to the needs of the partners. The end result will be to increase the resources needed to support NHS activities.

- o COLORADO SPRINGS NHS/Marketing Strategy Project. (Colorado Springs, Colorado)

Appendix H

NEIGHBORHOOD HOUSING SERVICES OF AMERICA, INC.

Neighborhood Housing Services of America, Inc. (NHSA) was established as a private nonprofit, state-chartered, tax-exempt corporation in 1974. It gives added private sector strength to the NHS programs, and, through a secondary market, give the NHS programs access to the private investor market as a resource for replenishing their loan funds.

It was anticipated in NHSA's formation that this and other activities to meet common needs of the NHS programs would be carried out by NHSA in cooperation with Neighborhood Reinvestment. This approach has been effective and its continuation was authorized in the enabling legislation for Neighborhood Reinvestment:

> "The Corporation (Neighborhood Reinvestment) shall continue the work of the Urban Reinvestment Task Force in supporting Neighborhood Housing Services of America, a nonprofit corporation established to provide services to local neighborhood housing services programs, with grants to expand its national loan purchase pool, and may contract for service which it can perform more efficiently or effectively than the Corporation."

NHSA is a California corporation headquartered in Oakland, California. Its by-laws call for a 15-member board of directors and it currently operates with a staff of 21 persons located in Oakland; and Baltimore, Maryland. The staff was organized to contain all the staff and partnership skills involved in the NHS programs — financial, community, and governmental processes — and, on the basis of these skills, is able to make contributions to many aspects of Neighborhood Reinvestment's work related to NHS operations in general, as well as to the NHS revolving loan fund operations.

NHSA's board of directors includes volunteers representing the same resident-city-financial industry partnership which is the foundation of all the NHS programs, and functions as a resource board for the NHS programs both technically and substantively.

Secondary Market Operations

Because NHS revolving loan funds are designed to meet the needs of low income people, repayment schedules must be extended over several years to meet the borrower's ability to pay, and the funds revolve slowly. Thus, there is a need for an infusion of new capital to insure that the revolving loan funds keep pace with each program's ability to upgrade its neighborhood. Just as savings and loan associations and banks need a secondary market to which they can sell loans to replenish their ability to make new loans, the NHS programs also need a secondary market for their revolving loan funds.

To provide a mechanism for the continued flow of revolving loan dollars into NHS neighborhoods, NHSA created a loan purchase pool to serve as an interim secondary market for the purchase of loans from local NHS programs. Annual contributions averaging $480,000 per year from the Neighborhood Reinvestment Corporation provided capital to set up and operate the loan purchase pool. In the meantime, NHSA secured the first buyer to change the character of the loan purchase pool into a true secondary market.

The buyer was The Equitable Life Assurance Society of the United States. In 1978, the Equitable signed a loan purchase agreement for $1 million in ten-year notes at a below market rate of 8-1/2 percent and later agreed to buy an additional $2 million worth of notes.

In 1981, The Prudential Insurance Company of America committed to purchase $5 million in 25-year notes at a below market rate of 9-1/2 percent for a First Mortgage Loan Purchase Program. The Prudential commitment is earmarked to those "problem properties" that escape the routine NHS upgrading procedures to which most homeowners respond. Strategies to address these properties include the purchase and rehabilitation of vacant houses, infill construction of new homes on vacant lots, and purchase, rehab and sale, or rental of blighted rental properties.

Early experience in the sale of loans to the secondary market has resulted in the replenishment of 58 NHS revolving loan funds to date totaling over $5 million, and future purchase commitments of $2 million. This early experience has also served to develop a workable, dependable mechanism for the NHS secondary market social investments which are needed to assist more than 180 local partnerships in upgrading urban neighborhoods across the nation.

The NHS secondary market is designed to provide substantial assurance to the social investors that NHSA can meet the financial requirements due under any Note Purchase Agreements. The built-in features have worked well in practice since the first note was issued to The Equitable Life Assurance Society of the United States in November, 1978.

NHS mortgages and a cash fund to assure timely payment of principal and interest payments on the NHSA notes are held by a bank trustee for the benefit of the note purchaser. As further security, when any loan being used for collateral for this indebtedness becomes 90 days delinquent, a non-delinquent loan is substituted for it. NHSA replaces the delinquent loan from its portfolio and then, under its agreement with the local NHS, the delinquent loan is returned to the NHS and another non-delinquent loan is forwarded to NHSA.

Servicing of the NHS loans which serve as collateral for the NHSA notes remains with the local NHS. Payments are forwarded to NHSA monthly. NHSA forwards payments to the trustee quarterly. The trustee holds the payments in a "Payment Fund" which is utilized to meet the quarterly payments due on the notes issued by NHSA under the Note Purchase Agreement.

The experience to date has shown no need to use any of the guarantee funds which were set aside to cover delinquencies. This is due to two factors: the NHSs make every effort to offer NHSA loans which they believe will not require substitution; and where substitutions are needed, there has been full cooperation. The need for substitution has been minimal, however, averaging about four per quarter and totaling only 65 over the four-year period of operations out of a total of 734 loans totaling $5,010,318 through September 1982.

One important reason that the secondary market operations can enjoy a sound loan experience is that the NHS loans are made at the ability of the borrower to repay. The interest rates on the NHS loans range from 0 percent to the market rate. NHSA purchases the NHS loans at par and seeks a balance offering of loans with an average rate and term which approximate the average rate and term of the NHS's overall loan portfolio. This has resulted in NHSA loan purchases which average a 5.31 percent interest rate and a 12-year term from NHS clients with a median household income of $9,540 per annum.

Financial Development

Beginning in 1980, Neighborhood Reinvestment and Neighborhood Housing Services of America began working actively to promote a broader base of financial support for NHS programs locally and to explore the feasibility of a national fund raising effort.

The need for expanding private sector support is crucial to the work of NHSs for four reasons:

-- Economic conditions have put unusual demands on private contributions, and increased competition for the limited funds available.

-- The problems experienced by the thrift industry have reduced its ability to continue its earlier leading financial support role.

-- The "costs of success" require additional dollars for NHS operating budgets and revolving loan funds to keep pace with the programmatic and geographic expansions of NHS programs.

-- The escalation of construction costs and interest rates for the past several years strained the capacity of individual NHS revolving loan funds -- this, in turn placed additional requirements on the secondary market administered by NHSA.

Significant progress has been achieved to date in this financial development effort. The resources available for this purpose have been very carefully applied to attain maximum lasting progress — focusing first on good preparation and good training and then on actual fund raising activities, giving priority to local fund raising needs.

During 1982, NHSA began direct work with several cities providing staff assistance to actually carry out fund raising for a local NHS program as distinguished from the counseling provided by Neighborhood Reinvestment staff. In the "hands on" efforts undertaken by NHSA, a pattern was established for the fund raising assistance which had been requested by the NHS fund raising advisory committee. Fund raising campaigns to both solidify existing support and to obtain new contributors were undertaken for five NHS programs. In addition, pre-campaign work was carried out for a state-wide campaign for ten programs and a metropolitan area-wide campaign for an additional six programs.

Out of this activity, additional learning has taken place and NHSA has provided an expanded NHS fund raising guide to all Neighborhood Reinvestment field staff. In addition, all Neighborhood Reinvestment field staff members received further training in fund raising counseling during December, 1982 and January, 1983.

NHSA has been carefully and methodically working towards a national fund raising campaign since 1980. This work has been divided into conceptualization of the campaign and obtaining concensus within the NHS network, research, cultivation of advance commitments, cultivation of leadership, and preparation of a suitable campaign environment through publicity. By working carefully and cooperatively with NHS leadership throughout the country, NHSA has been able to ensure that the results and activities of the national campaign will be perceived to be, as well as actually be, compatible with and supportive of local NHS fund raising. The desire to leverage contribution receipts through the secondary market led to a campaign concept which requests corporate contributions that, in turn, trigger precommitted insurance industry social investments of approximately five times the amount of the contribution.

The campaign is designed to address a need for secondary market resources for the balance of the 1980s projected to be in the order of magnitude of $100,000,000 to $150,000,000. The projection includes $50,000,000 for the "regular" secondary market of loans to owner-occupants for rehabilitation purposes which average ten years in term and yield an average of 6%, similar to Equitable's $3,000,000 purchase. This projection is based upon the history of purchases in past years, current requests, and a projection of the number of NHS programs to be served in future years.

An estimate of requirements for up to $100,000,000 in below-market first mortgage funds, similar to those provided by Prudential's $5,000,000 commitment is based upon an assumption of continued high interest rates. The availability of social investment funds below 10% interest rates has made all the difference in carrying out Problem Properties Strategies and providing affordable housing to moderate income families. This projected need would be revised downwards considerably if mortgage rates were to drop to 10% or below.

In preparation for a national campaign and in support of local NHS campaigns, NHSA has been conducting research, and has developed the technical capacity to provide top flight professional assistance to local NHS programs in developing materials and presentations.

The most significant breakthrough in creating the proper climate for a campaign was the action last month by the Campaign Selection Committee of The Advertising Council, Inc. It is expected that the intensive business press campaign which the Ad Council is planning to conduct for NHS on a nationwide basis, will create the backdrop of name recognition and national significance necessary to enlist appropriate leadership and enable that leadership to conduct a successful campaign.

Educational Development

NHSA, at the request of Neighborhood Reinvestment, has taken the lead in a long-term educational development project.

Because of the new fields of training inherent in NHS and the generally limited educational resources available in nonprofit organization administration, NHSA is undertaking the development of educational resources for the NHS network at the following levels: internships; bachelor degree programs; master degree programs; and seminars in continuing professional education.

The objective at each level is to institutionalize the results so that as large a measure as possible of the nation's public/private educational institutions can pick up the long-term responsibility for providing for the educational needs of the NHS network.

One segment of the integrated model designed to achieve this goal is a special masters degree program at the University of San Francisco-College of Professional Studies. The 13-month program, developed by NHSA and the University, highlights nonprofit housing/neighborhood revitalization concerns and uses NHS as a centerpiece. This program started its second class of masters candidates in October, 1982. Several candidates from the first program are actively seeking NHS related employment. Efforts to replicate similar programs in other locations continue.

Progress is being made toward initiation of a bachelor level program at several institutions.

At the internship level, a very successful Data Collection Internship has been initiated. Including its pilot in 1981, 80 NHS programs have participated in the internship along with 66 colleges and universities in 1982 alone. Major goals of the internship include the fostering of linkages between NHS programs and their local college communities so that access to additional staff and other resources may be obtained; and to enhance data collection capabilities and capacities of NHS programs.

Mutual Housing Association Demonstration

Purpose: To develop publicly accountable, competent private nonprofit organizations committed to continued annual production of new and rehabilitated housing at costs affordable to lower- to middle-income families and individuals typical of NHS neighborhoods.

Broadly defined, a Mutual Housing Association develops, owns and manages housing in the public interest. An association is comprised of a partnership of persons seeking housing and persons concerned about and with expertise in providing housing. It is a continuous provider of housing for members through the planned utilization of its assets for continuous new construction or rehabilitation. Acting through its Board of Trustees elected by the members, an association provides overall management for the housing complexes, encourages pride and involvement among resident members, and assures a high level of maintenance of both private and common spaces.

The Mutual Housing Association demonstration includes a model system which offers a form of tenure that provides its resident members both the privilege of life-time occupancy and a quality home at an affordable cost. The member shares in both the cost of production through a one-time membership fee and in the maintenance and management responsibilities. This mutual housing model offers a new alternative which falls between America's two traditional housing forms — ownership and rental, combining aspects of the financial and maintenance responsibilities of the resident found in each.

The Mutual Housing Association demonstration also includes a model system of financing. It is designed to test a flexible, nonbureaucratic, cost-effective way for the production, maintenance and management of housing for lower income families. The financing mechanism is based on a front-end capitalization grant and membership fees combined with a small conventional mortgage. The capitalization grant to the association is advanced to a given complex of homes and the rent calculation includes gradual repayment of this grant to the association where it becomes a source of capital for future development and provision for major replacement and modernization needs. Since the ownership vests in the association rather than the occupants, refinancing provides a further source of self-generated capital to the association.

The advantages of the capitalization grant system include: 1) flexibility (as interest rates decline, the proportion of grant to mortgage declines for a given rent level); 2) a one-time direct subsidy that does not inflate; and 3) a congruency of goals of developer, consumer and grantor.

The advantages of the tenure and governance system includes neighborhood input into the level of maintenance, a balance between occupant interest and community interest in management decisions and, perhaps most important, a congruence of interest between "landlord" and "tenant" (the lack of this congruence has been perhaps the most glaring failure in America's past assisted housing efforts).

Language in the Housing and Community Development Act of 1980 encourages Neighborhood Reinvestment in its national demonstration of the Mutual Housing Association concept. Baltimore, Maryland was selected as the site for the first demonstration. This selection was based upon enthusiastic cooperation of the NHS partnership, the cooperative stance of the city government, and the availability of a suitable development site.

In late 1980, work began on the Mutual Housing Association in the Govans neighborhood in northeast Baltimore and the basic Partnership group was drawn from the existing Govans NHS partnership. The Govans neighborhood is predominately black, with a wide variety in housing stock. The median family income is 86% of the Baltimore city-wide median.

In early 1981, Neighborhood Reinvestment assigned staff to begin working with the Govans leaders to review and shape the mutual housing concept. Following a series of presentations to neighborhood and community leaders and the existing NHS of Govans Board, an outreach effort was initiated to identify renters from the neighborhood interested in learning about "mutual housing," participating in planning a new organization and, most importantly, considering living in a mutual unit. The existing neighborhood and NHS leaders agreed that they wanted mutual housing for Govans, and that it was imperative to involve the potential residents of mutual housing in the planning.

The following are the major accomplishments of this nine-month organizational period:

- Development of a mission statement for the association which states its purpose as developing, owning and managing housing for its members in the public interest and continuing to produce additional housing for new members.
- Adopting Articles of Incorporation and Bylaws, calling for a 25 member governing board representing a carefully balanced partnership.
- Adopting a membership policy which requires a financial commitment through a membership fee from resident members (set at $2,100 - $2,500) as well as outlining the philosophy of a mutual self-help housing organization.
- Developing the maximum sense of "psychological ownership" and security among the resident members.

The newly formed board is continuing to refine plans for association operations, and has an executive director in place who was hired on an interim basis during the preceding developmental period.

Also as part of this developmental process, an interim group of Govans leaders and a team of pro bono lending and real estate advisors worked with the staff and the Physical Development Committee. This group assisted in the selection of the ten acre site for the 160 unit development. The decision to begin planning of the first units was considered critical to generating a sense of reality and excitement concurrent to the planning of the association, particularly for the Govans neighborhood leaders and the potential residents. Philosophical goals, concepts and hopes for mutual housing were made real and more easily understandable through the actual planning of the first mutual housing environment.

As the long-term owner of its housing, the association has paid careful attention to designing a housing unit and community of quality, long-lasting construction. As a neighborhood-controlled and neighborhood-directed developer, the association has also worked with Govans leaders to design housing that complements and enhances the neighborhood.

An interim group began work with Neighborhood Reinvestment and Neighborhood Housing Services of America staff while the developmental process was going forward and began working towards the selection of a site for physical development. The local NHS partnership, Baltimore housing leaders, city, and pro bono technical consultants provided input in the selection of a 10-acre vacant lot as the site for an eventual 150 Mutual Housing Association units.

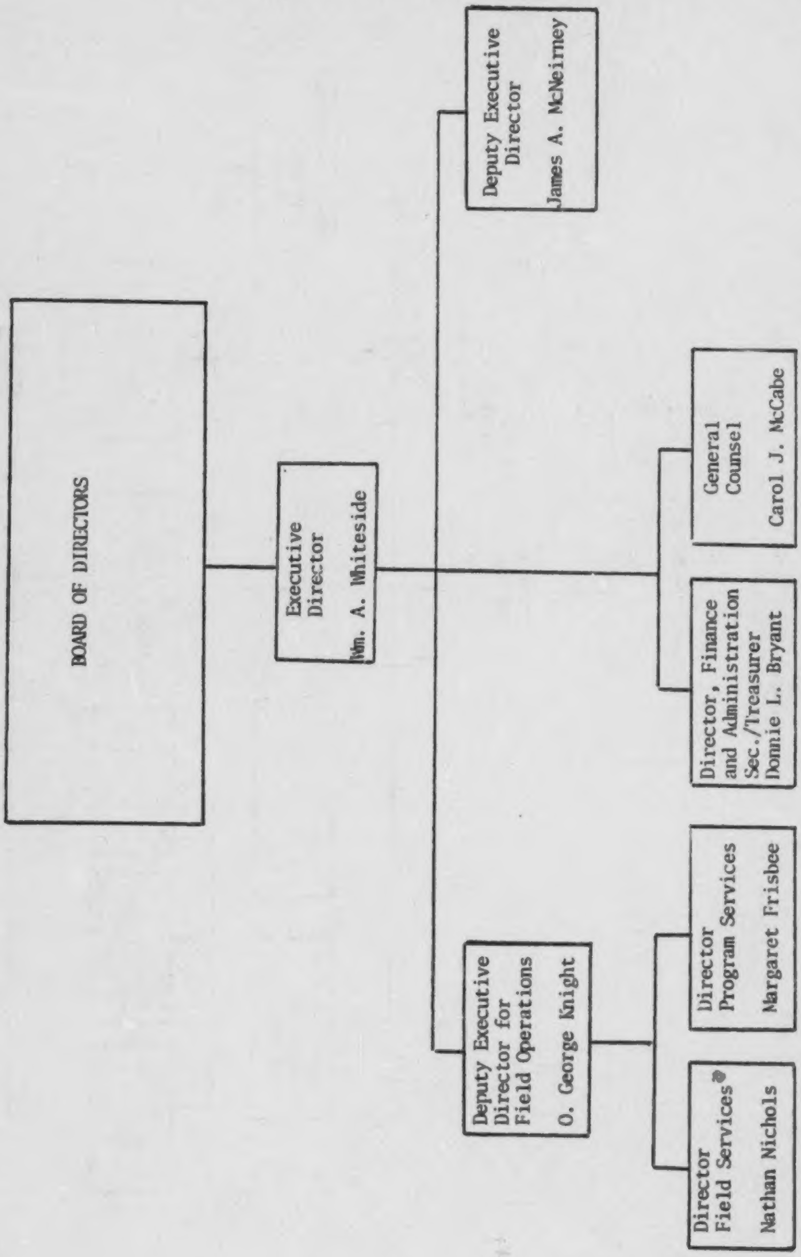
The land has been purchased and the partnership group has provided input to the architect in developing a site plan and working floor plans for the two-story brick townhouse units. Necessary zoning clearances have been obtained, and engineering has been completed.

A number of foundations have been approached to provide support for a capitalization grant to the Mutual Housing Association, and it is anticipated that work will begin in the spring or early summer on a pilot complex of brick townhouses.

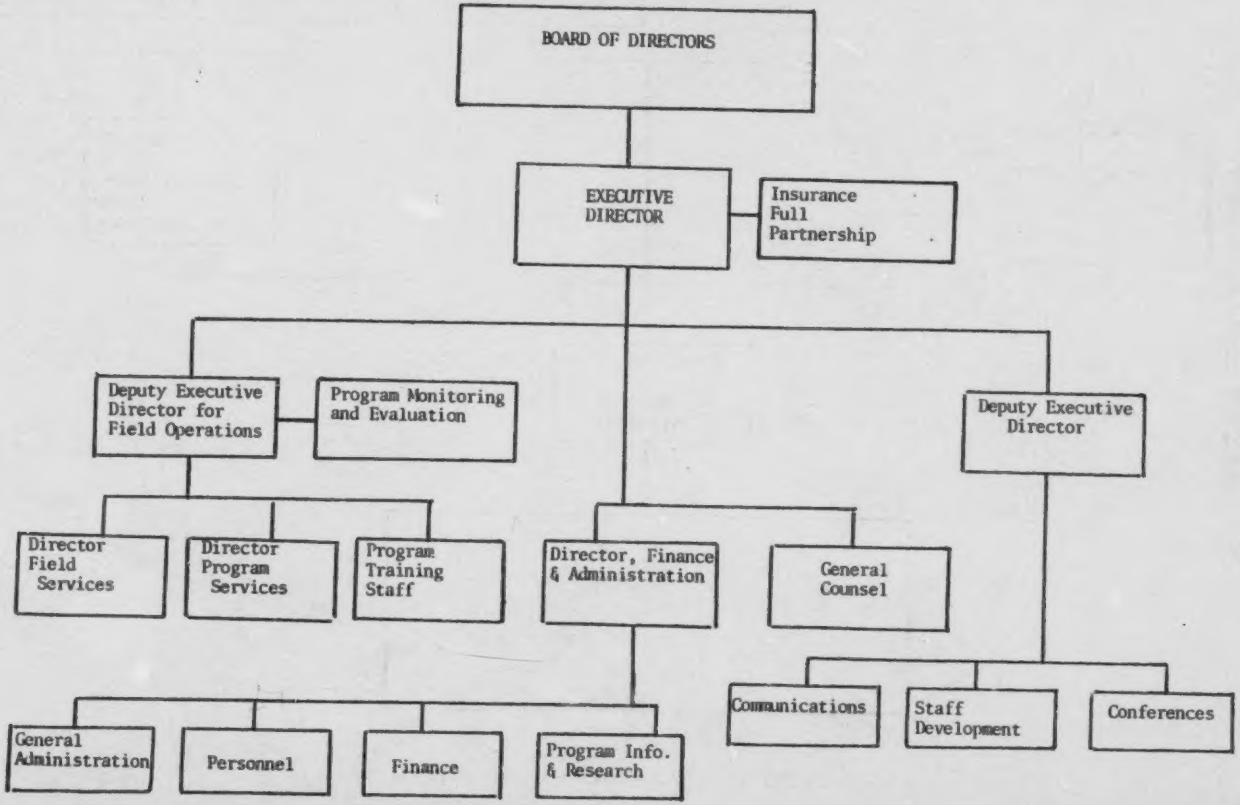
ORGANIZATION CHARTS/JOB CLASSIFICATIONS

Appendix I

THE BOARD OF DIRECTORS AND OFFICERS OF THE CORPORATION


BOARD OF DIRECTORS
Executive Director
Wm. A. Whiteside
Deputy Executive Director
James A. McNeirney
General Counsel
Carol J. McCabe
Director, Finance and Administration
Sec./Treasurer
Donnie L. Bryant
Deputy Executive Director for Field Operations
O. George Knight
Director Program Services
Margaret Frisbee
Director Field Services*
Nathan Nichols

ORGANIZATION CHART WITH PRELIMINARY
STAFF DISTRIBUTION - FY 1983


BOARD OF DIRECTORS
EXECUTIVE DIRECTOR
Insurance Full Partnership
Deputy Executive Director for Field Operations
Program Monitoring and Evaluation
Deputy Executive Director
Director Field Services
Director Program Services
Program Training Staff
Director, Finance & Administration
General Counsel
General Administration
Personnel
Finance
Program Info. & Research
Communications
Staff Development
Conferences

JOB CLASSIFICATION BY ORGANIZATIONAL UNITS

RANGE NUMBER	JOB TITLE	NUMBER OF POSITIONS
	EXECUTIVE SERVICES	
Executive Director's Office		
8	Senior Secretary	1
10	Administrative Secretary	1
12	Executive Secretary	1
12	Assistant Legislative Officer	1
24	Executive Assistant to Director	1
24	Internal Auditor	1
33	Deputy Executive Director	1
36	Executive Director	1
Insurance Full Partnership		
8	Senior Secretary	1
10	Insurance Field Services Asst.	1
16	Insurance Field Services Officer I	1
22	Legislative Officer/Ins. Prog. Coord.	1
Historic Preservation		
16	Historic Preservation Liaison	1
Communications		
10	Communications Assistant	1
12	Graphics Artist	1
18	Graphics Designer	1
18	Writer-Editor	1
22	Public Information Officer	1
26	Associate Director	1
Conference		
10	Conference Assistant	2
24	Assistant Director	1
Staff Development		
6	Secretary	1
8	Senior Secretary	1
12	Staff Development Assistant	1
16	Staff Development Specialist	1
18	Special Assistant	1
20	Staff Development Officer	1
26	Associate Director	1

RANGE NUMBER	JOB TITLE	NUMBER OF POSITIONS
	OFFICE OF THE GENERAL COUNSEL	
10	Administrative Secretary	1
20	Attorney	1
26	Deputy General Counsel	1
32	General Counsel	1
	FIELD OPERATIONS	
10	Administrative Secretary	1
20	Field Operations Officer	1
36	Deputy Executive Director	1
Program Monitoring		
22	Accounting Officer	1
26	Program Monitoring & Evaluation Coord.	1
Training		
6	Secretary	2
12	Program Assistant	1
16	NHS Rehab Trainer	1
18	Senior Trainer	2
22	Assistant Training Director	2
26	Training Director	1
	FIELD SERVICES	
10	Administrative Secretary	1
12	Field Staff Liaison	1
18	Special Assistant	1
32	Director	1
Neighborhood Program Development Technical Services		
6	Secretary	9
8	Field Office Assistant	9
10	Regional Administrator's Asst.	4
16	Field Services Officer I	12
18	Field Services Officer II	15
18	Construction Specialist	1
22	Field Services Officer III	15
24	Program Review Manager	4
24	District Supervisor	12
27	Regional Administrator	4
	PROGRAM SERVICES	
12	Program Assistant	1
32	Director	1

RANGE NUMBER	JOB TITLE	NUMBER OF POSITIONS
Neighborhood Preservation Development		
8	Field Office Assistant	1
16	Owner-Built Pre-Construction Advisor	1
18	Owner-Built Construction Advisor	1
18	Program Services Officer I	1
22	Program Services Officer III	1
24	Owner-Built Manager	1
27	Associate Director	1
Commercial Revitalization		
8	Field Office Assistant	1
18	Program Services Officer II	1
25	Commercial Revitalization Manager	1
Neighborhood Preservation Projects		
8	Senior Secretary	1
16	Program Services Officer I	1
18	Program Services Officer II	1
26	Associate Director	1
Apartment Improvement Program		
6	Secretary	1
8	Field Office Assistant	1
18	Program Services Officer II	6
24	Assistant Director	1
25	Manager	1
27	Associate Director	1
	FINANCE AND ADMINISTRATION	
10	Administrative Secretary	1
12	Budget Assistant	1
27	Associate Director/Budget Officer	1
34	Director	1
Finance		
5	Accounting Clerk	1
6	Secretary	1
8	Accounting Specialist	5
11	Payroll Analyst	1
14	Asst. Accounts Payable Supervisor	1
18	Accounts Payable Supervisor	1
18	Accountant	1
22	Assistant Controller	1
26	Controller	1

RANGE NUMBER	JOB TITLE	NUMBER OF POSITIONS
Personnel		
5	Personnel Clerk	1
8	Senior Secretary	1
11	Personnel Assistant	1
20	Personnel Officer	1
24	Assistant Director	1
Administration		
4	Office Services Assistant	1
4	Receptionist	1
8	Purchasing Assistant	1
8	Data Center Specialist	1
11	Data Center Supervisor	1
12	Office Services Supervisor	1
24	Assistant Director	1
Program Information and Research		
8	Senior Secretary	2
14	Records Manager	1
16	Research Analyst	1
24	Assistant Director	1

NEIGHBORHOOD REINVESTMENT CORPORATION
COMPENSATION PLAN

JANUARY, 1983

RANGE NUMBER	SALARY RANGE
2	$10,418 - $14,302
4	$11,486 - $15,768
5	$12,060 - $16,556
6	$12,663 - $17,384
8	$13,961 - $19,165
10	$15,392 - $21,130
11	$16,162 - $22,187
12	$16,970 - $23,296
14	$18,709 - $25,683
16	$20,627 - $28,316
18	$22,741 - $31,219
20	$25,072 - $34,418
22	$27,642 - $37,947
24	$30,476 - $41,837
25	$31,999 - $43,928
26	$33,599 - $46,124
27	$35,279 - $48,431
28	$37,043 - $50,852
29	$38,896 - $53,396
32	$45,026 - $61,811
34	$49,642 - $68,148*
36	$54,730 - $75,133*
38	$60,340 - $78,056*

*Maximum amount payable is $63,800.

SUBCOMMITTEE RECESS

Senator GARN. The subcommittee will stand in recess until Thursday, May 5, 1983, at 10 a.m, when we will hear witnesses from the Department of Treasury Office of Revenue Sharing and the New York City Loan Program; the Federal Home Loan Bank Board; the National Credit Union Administration; and the Environmental Protection Agency.

Thank you very much. The committee is recessed.

[Whereupon, at 1:25 p.m. Thursday, April 28, the subcommittee was recessed to reconvene at 11 a.m. Thursday, May 5.]

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT-INDEPENDENT AGENCIES APPROPRIATIONS FOR FISCAL YEAR 1984

THURSDAY, MAY 12, 1983

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, D.C.

The subcommittee met at 10 a.m. in room SD-124, Dirksen Senate Office Building, Hon. Jake Garn (chairman) presiding.

Present: Senators Garn and D'Amato.

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

STATEMENT OF HON. SAMUEL R. PIERCE, JR., SECRETARY

ACCOMPANIED BY:
- DONALD I. HOVDE, UNDER SECRETARY
- BENJAMIN BOBO, ACTING ASSISTANT SECRETARY FOR POLICY DEVELOPMENT AND RESEARCH
- PHILIP ABRAMS, ASSISTANT SECRETARY FOR HOUSING—FEDERAL HOUSING COMMISSIONER
- JOHN KNAPP, GENERAL COUNSEL
- ROBERT W. KARPE, PRESIDENT, GOVERNMENT NATIONAL MORTGAGE ASSOCIATION
- RICHARD FRANCIS, COMPTROLLER, SOLAR ENERGY AND ENERGY CONSERVATION BANK
- STEPHEN BOLLINGER, ASSISTANT SECRETARY FOR COMMUNITY PLANNING AND DEVELOPMENT
- WARREN T. LINDQUIST, GENERAL MANAGER, NEW COMMUNITY DEVELOPMENT CORPORATION
- ANTONIO MONROIG, ASSISTANT SECRETARY FOR FAIR HOUSING AND EQUAL OPPORTUNITY
- STEPHEN MAY, ASSISTANT SECRETARY FOR LEGISLATION AND CONGRESSIONAL RELATIONS
- JUDITH L. TARDY, ASSISTANT SECRETARY FOR ADMINISTRATION
- PAUL ADAMS, ACTING INSPECTOR GENERAL
- LANCE WILSON, EXECUTIVE ASSISTANT TO THE SECRETARY
- GORDON WALKER, DEPUTY UNDER SECRETARY FOR FIELD COORDINATION
- JUNE KOCH, DEPUTY UNDER SECRETARY FOR INTERGOVERNMENTAL RELATIONS
- JOY MOORE, DEPUTY ASSISTANT SECRETARY FOR LEGISLATION

ACCOMPANIED BY—Continued

JANET HALE, [illegible] ASSISTANT SECRETARY FOR POLICY AND BUDGET, OFF[illegible]OUSING

ALBERT J. KLIM[illegible]PARTMENTAL BUDGET OFFICER

OPENING REMARKS OF CHAIRMAN

Senator GARN. The subcommittee will come to order.

Mr. Secretary, it is a pleasure to welcome you here for your hearings on the Department's fiscal year 1984 budget request. I would like to express my appreciation to you and to your colleagues, especially Assistant Secretary Abrams, for your assistance and cooperation during the last year—in particular your efforts to break the financing and regulatory logjam that will help move more than 100,000 assisted housing units in the pipeline to construction.

Since we are only having one day of hearings on HUD this year, I will not attempt to cover the same ground that was the subject of 3 days of hearings before the Senate Banking Committee. Instead, my questions will be devoted to those areas specifically relevant to the appropriations process.

PREPARED STATEMENT

I am aware you have a 35-page statement. I am sure we would all appreciate it if you would abbreviate that statement. [Laughter.] We will put all 35 pages in its entirety in the record.

[The statement follows:]

STATEMENT OF SECRETARY SAMUEL R. PIERCE, JR.

IT IS AGAIN MY PLEASURE TO APPEAR BEFORE YOU. THIS TIME TO PRESENT THE 1984 BUDGET PROPOSALS OF THE DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT. LAST YEAR, I STATED THE ADMINISTRATION'S BASIC PREMISE WAS--AND TODAY CONTINUES TO BE--"THAT IN THE LONG RUN THE ONLY REAL SOLUTION TO MEETING THIS NATION'S HOUSING NEEDS IS TO BRING INFLATION UNDER CONTROL AND FOR INTEREST RATES TO DROP TO MORE REALISTIC LEVELS." I STATED FURTHER THAT THE PRESIDENT'S ECONOMIC RECOVERY PROGRAM HAD JUST BEGUN TO TAKE EFFECT AND THAT INTEREST RATES COULD BE EXPECTED TO DECLINE "ONCE THE FINANCIAL MARKET PLACE BELIEVES THAT WE WILL STICK TO OUR PROGRAM TO LICK INFLATION."

WELL, MR. CHAIRMAN, IF I MAY BE EXCUSED FOR BOASTING JUST A LITTLE, THE RESULTS ARE IN AND OUR FAITH HAS BEEN VINDICATED--INFLATION IS WELL ON ITS WAY TO BEING LICKED AND INTEREST RATES HAVE DECLINED SHARPLY! THESE ARE RESULTS FOR WHICH WE ALL CAN BE JUSTLY PROUD AND FOR WHICH CREDIT CAN BE SHARED--BOTH BY THE ADMINISTRATION AND THE CONGRESS. AT THE END OF CALENDAR YEAR 1981, THE ANNUAL RATE OF INFLATION WAS DOWN TO 8.9 PERCENT. IT HAD BEEN CUT FURTHER TO 6.8 PERCENT BY THIS TIME LAST YEAR, DROPPED TO 3.9 PERCENT BY THE END OF 1982, AND THE DOWNWARD TREND HAS CONTINUED.

OVER THE PAST YEAR, INTEREST RATES ON SINGLE FAMILY FHA HOME MORTGAGES HAVE DECLINED FROM 15.5 PERCENT TO 12 PERCENT. THESE NUMBERS TRANSLATE INTO REAL LIFE, MEANINGFUL BENEFITS TO THE AMERICAN ECONOMY AND HOMEBUYERS. AS THIS COMMITTEE IS WELL AWARE, MR. CHAIRMAN, FHA-MORTGAGE INSURANCE ACTIVITY HAS BEEN SETTING RECORDS IN RECENT MONTHS, WITH APPLICATIONS FOR SINGLE FAMILY INSURANCE RUNNING AT NEARLY 70,000 PER MONTH FOR THE FIRST HALF OF FISCAL YEAR 1983. THIS LEVEL OF

ACTIVITY IS UP MORE THAN 200 PERCENT OVER THE SAME PERIOD OF ONE YEAR EARLIER.

MOREOVER, HOUSING STARTS--BOTH PUBLIC AND PRIVATE--FOR THE FIRST THREE MONTHS OF CALENDAR 1983 ARE UP 82 PERCENT OVER THE SAME PERIOD OF 1982. FOR ALL OF CALENDAR YEAR 1982, STARTS WERE LESS THAN 1.1 MILLION, WHILE 1983 STARTS ARE EXPECTED TO BE IN A RANGE OF 1.5 TO 1.7 MILLION, PLUS 250,000 UNITS OF MANUFACTURED HOUSING. A FURTHER MEASURE OF THE IMPROVING ECONOMY, AS IT IMPACTS ON HOUSING PRODUCTION, CAN BE SEEN IN THE NUMBER OF BUILDING PERMITS ISSUED BY LOCAL GOVERNMENTS. FOR THE FIRST QUARTER OF CALENDAR 1983, THE NUMBER OF PERMITS ISSUED WERE UP 75 PERCENT OVER THE SAME QUARTER OF 1982.

INCREASED HOUSING PRODUCTION ON THE PART OF THE PRIVATE SECTOR MEANS HOUSING OPPORTUNITY, JOBS, AND A HEALTHY ECONOMY. WE ARE GREATLY ENCOURAGED BY THE CLEAR SIGNS OF ECONOMIC RECOVERY, YET WE RECOGNIZE FULLY THE RESPONSIBILITY OF GOVERNMENT TO ADDRESS THE HOUSING NEEDS OF THE POOR AS WELL. WE DO NOT BELIEVE THAT THESE NEEDS MUST, OR SHOULD BE MET, THROUGH A LARGE AND COSTLY SUBSIDIZED HOUSING PRODUCTION PROGRAM. INSTEAD, WE PROPOSE A PROGRAM WHICH ADDRESSES THE KEY ISSUE--AFFORDABILITY. OUR PROPOSAL FOR HOUSING PAYMENT CERTIFICATES, OR "VOUCHERS", IS DESIGNED TO HELP POOR PEOPLE AFFORD GOOD HOUSING LOCATED WITHIN THE TOTAL COMMUNITY, NOT ISOLATED IN PROJECTS. OUR BUDGET PROPOSES APPROVAL OF 120,000 CERTIFICATES IN 1984--INCLUDING 80,000 TARGETED TO ASSIST ADDITIONAL FAMILIES. THE SENATE BANKING COMMITTEE HAS AGAIN ENDORSED THIS CONCEPT AND IS RECOMMENDING AN AUTHORIZATION OF SOME 58,000 CERTIFICATES, 40,000 OF WHICH WOULD BE TIED TO THE RENTAL REHABILITATION INITIATIVE BEING CONSIDERED BY THAT COMMITTEE.

WE CONSIDER THE CERTIFICATE PROPOSAL THE MOST HUMANE, MOST SOCIALLY POSITIVE AND MOST COST-EFFECTIVE MEANS OF MEETING THE SHELTER NEEDS OF OUR

NATION'S POOR. THE CONCEPTS BEHIND THE CERTIFICATE PROGRAM ARE STRAIGHTFORWARD:

— A HOUSING PAYMENT CERTIFICATE IS ISSUED BY A LOCAL PUBLIC HOUSING AUTHORITY TO A FAMILY OR AN INDIVIDUAL ELIGIBLE FOR HOUSING ASSISTANCE.

— THE CERTIFICATE ENABLES THE FAMILY TO SHOP FOR DECENT, SAFE AND SANITARY RENTAL HOUSING AND GUARANTEES PAYMENT TO THE LANDLORD FOR A PORTION OF THE RENT.

— THE CERTIFICATE OFFERS A "SHOPPING INCENTIVE." THIS MEANS THE FAMILY RECEIVING ASSISTANCE MAY CHOOSE THE AMOUNT IT DESIRES TO SPEND FOR SHELTER, AS WELL AS WHERE IT WISHES TO RESIDE. HUD WILL PAY THE DIFFERENCE BETWEEN 30 PERCENT OF THE FAMILY'S ADJUSTED GROSS INCOME AND A RENT STANDARD FOR A GIVEN AREA. THE FAMILY MAY CHOOSE TO RENT FOR LESS THAN THIS STANDARD LEVEL AND POCKET THE SAVINGS, OR IT IS FREE TO SPEND MORE, SHOULD IT SO CHOOSE.

-- GENERALLY, SUFFICIENT DECENT RENTAL HOUSING IS AVAILABLE IN THE PRIVATE MARKET FOR CERTIFICATE HOLDERS. BUT, A SUPPORTING PROGRAM OF RENTAL REHABILITATION GRANTS IS PROPOSED TO INCREASE THE SUPPLY OF USABLE UNITS IN LOW- AND MODERATE-INCOME AREAS.

HIGHLIGHTS OF 1984 BUDGET REQUEST

AT THIS POINT, MR. CHAIRMAN, I WOULD LIKE TO HIGHLIGHT SOME OF THE KEY FIGURES AND PROPOSALS INCLUDED WITHIN OUR BUDGET REQUEST.

FOR 1984 THE BUDGET, AS SUBMITTED, PROPOSED NET BUDGET AUTHORITY OF $4.1 BILLION. THIS INCLUDED APPROXIMATELY $7.2 BILLION IN NEW BUDGET

AUTHORITY OFFSET BY $2.9 BILLION IN RESCISSIONS UNDER THE SECTION 236 AND RENT SUPPLEMENT PROGRAMS. THE BUDGET AUTHORITY REQUEST HAS NOW BEEN INCREASED BY $3.1 BILLION TO ALLOW THE DEPARTMENT TO CONTINUE ITS EFFORTS TO CONVERT RENT SUPPLEMENT AND SECTION 236 RAP UNITS TO SECTION 8. THIS ADDITIONAL $3.1 BILLION IS THE RESULT OF THE CONGRESS DISAPPROVING THE DEFERRAL OF $3.1 BILLION OF 1983 FUNDS.

OTHER MAJOR REQUESTS FOR 1984 INCLUDE $1.6 BILLION FOR PUBLIC HOUSING OPERATING SUBSIDIES, $3.5 BILLION FOR COMMUNITY DEVELOPMENT BLOCK GRANTS (INCLUDING $75 MILLION FOR INDIAN ASSISTANCE), $196 MILLION FOR URBAN DEVELOPMENT ACTION GRANTS, $150 MILLION FOR THE PROPOSED RENTAL REHABILITATION GRANT PROGRAM, AND $76 MILLION FOR THE PROPOSED INDIAN HOUSING GRANT PROGRAM.

THESE BUDGET PROPOSALS MAY BE COMPARED TO ACTIONS TAKEN THUS FAR BY THE SENATE BANKING COMMITTEE ON THE DEPARTMENT'S 1984 BUDGET PROPOSALS. THESE ACTIONS INCLUDE $7.65 BILLION IN BUDGET AUTHORITY AUTHORIZED FOR ASSISTED HOUSING, INCLUDING $2 BILLION FOR MODERNIZATION. THE COMMITTEE HAS ALSO AUTHORIZED $1.5 BILLION FOR PUBLIC HOUSING OPERATING SUBSIDIES; AND $3.966 BILLION IN BUDGET AUTHORITY FOR COMMUNITY DEVELOPMENT INCLUDING $440 MILLION FOR URBAN DEVELOPMENT ACTION GRANTS. THEY ARE ALSO AUTHORIZING THE RENTAL REHABILITATION PROGRAM AT $850 MILLION, WHICH INCLUDES $550 MILLION FOR THE HOUSING PAYMENT CERTIFICATES, WHICH THEY ARE TYING TO THE UNITS REHABILITATED.

AS FOR OUTLAYS, THE BUDGET INITIALLY PROJECTED $13.7 BILLION IN 1984 COMPARED WITH $14.8 BILLION FOR 1983--A DECREASE OF $1.1 BILLION. THESE ESTIMATES HAVE SUBSEQUENTLY BEEN REVISED TO REFLECT THE EFFECTS OF THE RECENTLY ENACTED "JOBS BILL." THE REVISED 1984 ESTIMATE IS $14.3 BILLION WHICH IS $855 MILLION LESS THAN THE REVISED ESTIMATE FOR 1983.

FISCAL YEAR 1984 EMPLOYMENT WILL DECLINE TO AN ESTIMATED 11,791 FULL-TIME PERMANENT EMPLOYEES FROM 12,929 AT THE END OF 1983 AND 13,828 ACTUAL EMPLOYEES AT THE END OF 1982. THESE REDUCTIONS ARE BASED ON LOWER PROGRAM LEVELS IN 1983 AND 1984 AND MORE EFFICIENT USE OF STAFF, PARTICULARLY IN THE AREA OF SINGLE FAMILY MORTGAGE INSURANCE. IN THE AGGREGATE, THESE STAFFING REDUCTIONS SHOULD BE EFFECTED, ESSENTIALLY, THROUGH ATTRITION. TO THE EXTENT WORKLOAD IMBALANCES OCCUR, SELECTIVE HIRINGS AND REDUCTION-IN-FORCE ACTIONS MAY BE NECESSARY.

ONE OF OUR MAJOR HOUSING PROGRAM INITIATIVES IS OUR PROPOSAL FOR PUBLIC HOUSING OPERATING SUBSIDIES. THE 1984 APPROPRIATION REQUEST OF MORE THAN $1.6 BILLION REFLECTS A MAJOR REFORM IN THE METHOD OF CALCULATING OPERATING SUBSIDY REQUIREMENTS. MAJOR ELEMENTS OF THE PROPOSAL INCLUDE: (1) COMPUTING OPERATING SUBSIDY AND CAPITAL IMPROVEMENT REQUIREMENTS BASED ON LOCAL FAIR MARKET RENTS FOR EXISTING HOUSING; (2) A "REPLACEMENT ALLOWANCE" FOR ROUTINE MAINTENANCE AND MAJOR REPAIRS; AND (3) TRANSITION MODERNIZATION FUNDING TO FINANCE IMMEDIATE CAPITAL IMPROVEMENTS--PARTICULARLY ENERGY CONSERVATION IMPROVEMENTS--NECESSARY TO CORRECT SUBSTANDARD HOUSING CONDITIONS AND THEREBY REDUCE OPERATING COSTS.

BUDGET AUTHORITY FOR THE TRANSITION MODERNIZATION ELEMENT, AMOUNTING TO $1.4 BILLION IN 1984, IS INCLUDED WITHIN THE ANNUAL CONTRIBUTIONS FOR ASSISTED HOUSING ACCOUNT AND IS IN ADDITION TO THE MORE THAN $1.6 BILLION REQUESTED UNDER THE OPERATING SUBSIDY ACCOUNT. FOR THE VAST MAJORITY OF THE 2,800 PUBLIC HOUSING AGENCIES, THE IMPACT OF THESE PROPOSALS SHOULD BE A TOTAL SUBSIDY EQUAL TO OR HIGHER THAN THAT WHICH THEY NOW RECEIVE UNDER THE EXISTING PERFORMANCE FUNDING SYSTEM.

EARLY IN MY TENURE AT HUD, THE SIGNIFICANT AND UNIQUE PROBLEMS OF INDIANS WERE BROUGHT TO MY ATTENTION. I MADE A COMMITMENT AT THAT TIME TO DO SOMETHING ABOUT THESE PROBLEMS AND ENGAGED IN WIDE-RANGING

DISCUSSIONS WITHIN THE ADMINISTRATION ABOUT INDIAN HOUSING. OUR 1984 LEGISLATIVE PACKAGE INCLUDES BOTH AN INDIAN HOUSING PROGRAM AND AN INDIAN COMMUNITY DEVELOPMENT BLOCK GRANT PROGRAM TO HELP MEET INDIAN HOUSING AND INFRASTRUCTURE NEEDS

A CORNERSTONE OF THE INDIAN HOUSING PROGRAM WILL BE THE USE OF SINGLE FAMILY FHA INSURANCE. THIS INSURANCE WILL MAKE HOMEOWNERSHIP AVAILABLE TO INDIANS WHO DO NOT PRESENTLY HAVE ACCESS TO PRIVATE FINANCING, AS DO OTHER AMERICANS, DUE TO THE UNIQUE STATUS OF INDIAN TRUST LANDS. IN ADDITION, HUD IS REQUESTING $76 MILLION IN BUDGET AUTHORITY FOR THE INDIAN HOUSING PROGRAM. THESE FUNDS WILL BE USED TO FACILITATE THE CONSTRUCTION AND SUPPORTING INFRASTRUCTURE NEEDS OF 1,500 HOMES AND TO MAKE CERTIFICATES AVAILABLE FOR VERY LOW-INCOME FAMILIES.

THE SECOND PROGRAM, THE INDIAN COMMUNITY DEVELOPMENT BLOCK GRANT PROGRAM, WILL BE FUNDED FROM THE SECRETARY'S DISCRETIONARY FUND, WHICH WOULD BE INCREASED BY $44 MILLION, FOR A TOTAL FUNDING LEVEL OF $75 MILLION FOR INDIAN TRIBES. NEW CONSTRUCTION WOULD ALSO BECOME AN ELIGIBLE ACTIVITY IN THE USE OF THESE FUNDS.

THE ADDITIONAL CDBG FUNDING FOR INDIAN TRIBES IS INCLUDED WITHIN THE TOTAL BLOCK GRANT REQUEST OF $3.5 BILLION. THIS MEANS WE PROPOSE TO CONTINUE FUNDING THE REMAINDER OF THE PROGRAM AT $3.456 BILLION--THE SAME LEVEL AS 1983, EXCLUDING THE SPECIAL $1 BILLION ADD-ON FOR UNEMPLOYMENT. IN ADDITION, WE PROPOSE A $196 MILLION APPROPRIATION FOR URBAN DEVELOPMENT ACTION GRANTS. LET ME EMPHASIZE, MR. CHAIRMAN, THE STRONG AND CONTINUING SUPPORT OF THIS ADMINISTRATION TO MEET THE COMMUNITY AND ECONOMIC DEVELOPMENT NEEDS OF THE NATION'S CITIES AND TOWNS THROUGH THE USE OF CDBG, UDAG AND OTHER PROGRAMS.

THE 1984 BUDGET AGAIN PROPOSES ENACTMENT OF A RENTAL REHABILITATION GRANT PROGRAM AT A FUNDING LEVEL OF $150 MILLION. THIS PROPOSAL WOULD PERMIT THE REHABILITATION OF APPROXIMATELY 30,000 RENTAL UNITS AND IS AN ESSENTIAL COMPONENT OF OUR OVERALL PROGRAM TO HELP PROVIDE DECENT AND AFFORDABLE RENTAL HOUSING FOR FAMILIES ASSISTED THROUGH HOUSING CERTIFICATES. ANOTHER COMMUNITY DEVELOPMENT INITIATIVE IS THE PROPOSAL TO EXPAND THE URBAN HOMESTEADING PROGRAM TO INCLUDE MULTIFAMILY HOUSING. HERE TOO, WE ARE RESUBMITTING A PROPOSAL FIRST MADE LAST YEAR BUT NOT ACTED UPON BY THIS COMMITTEE IN THE ABSENCE OF AUTHORIZING LEGISLATION. OF THE $12 MILLION APPROPRIATION REQUEST, $3 MILLION WOULD BE EARMARKED FOR THE MULTIFAMILY DEMONSTRATION.

FINALLY, THE BUDGET REQUESTS $4.7 MILLION FOR THE FAIR HOUSING ASSISTANCE PROGRAM UNDER THE TITLE VIII FAIR HOUSING LEGISLATION. THIS INCLUDES $3.7 MILLION TO REIMBURSE STATE AND LOCAL AGENCIES FOR PROCESSING DISCRIMINATION COMPLAINTS AND $1 MILLION TO ASSIST COMMUNITY HOUSING RESOURCE BOARDS IN HELPING THE DEPARTMENT IMPLEMENT VOLUNTARY AFFIRMATIVE MARKETING PROGRAMS. MR. CHAIRMAN, YOU CAN BE ASSURED OF OUR CONTINUING COMMITMENT TO THE GOALS OF TITLE VIII.

HOUSING PROGRAMS

NOW, MR. CHAIRMAN I WOULD LIKE TO PRESENT MORE DETAIL ON THE 1984 BUDGET PROPOSALS.

FOR 1984 WE ANTICIPATE THE MAJOR PART OF ASSISTANCE PROVIDED BY HUD TO BE IN THE FORM OF HOUSING PAYMENT CERTIFICATES. UNDER THE HOUSING PAYMENT CERTIFICATE (HPC) PROGRAM WHICH WE ARE PROPOSING IN THIS BUDGET, FUNDING WOULD BE MADE AVAILABLE TO RESERVE AN ESTIMATED 120,340 UNITS IN 1984. INCLUDED IN THIS TOTAL ARE 80,000 INCREMENTAL CERTIFICATES OF WHICH 30,000 WOULD BE MADE AVAILABLE FOR USE IN CONJUNCTION WITH THE PROPOSED RENTAL REHABILITATION PROGRAM, WHICH I WILL EXPLAIN LATER IN THIS STATEMENT.

IN ADDITION TO THE INCREMENTAL UNITS, 26,000 CERTIFICATES ARE EXPECTED TO REPLACE THOSE SECTION 8 EXISTING CERTIFICATES THAT WILL BE EXPIRING DURING THE YEAR. FOR TENANTS OF PUBLIC HOUSING PROJECTS WHICH MAY BE SOLD OR DEMOLISHED, WE ARE SETTING ASIDE AN ESTIMATED 5,000 UNITS AS WELL AS 1,000 CERTIFICATES FOR TENANTS OF SECTION 8 NEW CONSTRUCTION/SUBSTANTIAL REHABILITATION PROJECTS WHOSE OWNERS HAVE CHOSEN NOT TO RENEW THEIR CURRENT FIVE-YEAR CONTRACT. THE DEPARTMENT ALSO PLANS TO MAKE AVAILABLE 8,340 CERTIFICATES TO ELIGIBLE TENANTS IN HUD-OWNED MULTIFAMILY PROJECTS IN ORDER TO FACILITATE THE DISPOSITION OF THOSE PROJECTS.

AS I HAVE ALREADY MENTIONED, THE NEW APPROACH IS SIMPLE AND IT IS EFFICIENT. INSTEAD OF PROVIDING MAXIMUM RENT CEILINGS BASED UPON PUBLISHED FAIR MARKET RENTS (FMR'S), A "PAYMENT STANDARD" WILL BE USED, BASED ON THE RENTAL COST IN A PARTICULAR AREA OF MODESTLY PRICED STANDARD HOUSING OF VARIOUS SIZES AND TYPES. THIS STANDARD WOULD BE USED, IN COMBINATION WITH APPROPRIATE DATA ABOUT FAMILY INCOME AND COMPOSITION, TO DETERMINE THE FEDERAL SUBSIDY AMOUNT TO BE PROVIDED.

A FAMILY WOULD BE PERMITTED TO RENT ABOVE THE PAYMENT STANDARD AMOUNT, BUT WOULD NOT RECEIVE ADDITIONAL SUBSIDY WHEN IT DID SO. AT THE SAME TIME, PROVIDED THAT THE SELECTED UNIT MET PRESCRIBED HOUSING QUALITY STANDARDS, A FAMILY ALSO WOULD BE PERMITTED TO RENT BELOW THE PAYMENT STANDARD AMOUNT WITHOUT REDUCTION TO THE SUBSIDY AMOUNT (SUBJECT TO A MINIMUM RENT). THE PROGRAM THUS CONTAINS A "SHOPPER'S INCENTIVE" WHICH SERVES BOTH TO CONTAIN THE INFLATIONARY IMPACT ON RENTS THAT IS EXPERIENCED IN THE CURRENT PROGRAM, AND, MORE IMPORTANTLY, TO PERMIT ASSISTED FAMILIES THE SIMILAR RANGE OF CHOICE BETWEEN HOUSING AND OTHER NEEDS THAT THEY WOULD EXERCISE IF UTILIZING ONLY THEIR OWN MONEY.

NEW CONSTRUCTION AND SUBSTANTIAL REHABILITATION ACTIVITIES WILL BE LIMITED TO RESERVATIONS FOR 10,000 SECTION 8 UNITS FINANCED IN CONJUNCTION

WITH THE SECTION 202 HOUSING FOR THE ELDERLY OR HANDICAPPED LOAN PROGRAM. ALTHOUGH MANY ELDERLY WILL PARTICIPATE IN THE PROPOSED HPC PROGRAM, WE ARE AWARE OF THE UNIQUE NEEDS OF THE ELDERLY AND I AM PROPOSING CONTINUATION OF THIS CONSTRUCTION PROGRAM IN 1984.

CONSISTENT WITH THE DEPARTMENT'S POSITION THAT, WITH LIMITED EXCEPTIONS, THE NEEDS OF THE POOR CAN BEST BE ADDRESSED THROUGH THE EXISTING HOUSING MARKET, WE ARE NOT REQUESTING CONTINUATION OF THE PUBLIC HOUSING CONSTRUCTION PROGRAM IN 1984.

INDIAN HOUSING PROGRAM

THE NEWLY STRUCTURED INDIAN HOUSING PROGRAM PROPOSED FOR 1984 WOULD UTILIZE FHA INSURED MORTGAGES, CONSTRUCTION GRANTS, AND RENTAL HOUSING CERTIFICATES TO PROVIDE RENTAL HOUSING AND HOMEOWNERSHIP OPPORTUNITIES. THE PROPOSED PROGRAM WOULD ALLOW INDIAN TRIBES THE FLEXIBILITY NECESSARY TO MEET THEIR UNIQUE HOUSING NEEDS. INDIAN TRIBES WOULD ADMINISTER THE PROGRAM, BUT COULD DELEGATE RESPONSIBILITIES TO INDIAN HOUSING AUTHORITIES. WITHIN CERTAIN BROAD GUIDELINES, THE TRIBES COULD DEVELOP THEIR OWN PROGRAM WHICH WOULD TAKE INTO ACCOUNT REASONABLE DEVELOPMENT COSTS FOR THE AREA AS WELL AS LOCAL INCOME LEVELS. I AM CONVINCED THAT THESE COMBINED PROGRAM INITIATIVES WILL ENSURE THE DEVELOPMENT OF HOUSING FOR RENTAL OR HOMEOWNERSHIP PURPOSES IN A COORDINATED MANNER AND IN ACCORDANCE WITH THE NEEDS OF EACH INDIAN TRIBE.

THE BUDGET INCLUDES $38 MILLION OF AUTHORITY FOR USE IN PROVIDING FRONT-END GRANTS FOR 1,500 NEWLY CONSTRUCTED UNITS, INCLUDING $26.8 MILLION FOR CONSTRUCTION WRITEDOWNS AND $11.2 MILLION FOR INFRASTRUCTURE COSTS. AN ADDITIONAL $38 MILLION IS BEING REQUESTED TO PROVIDE RENTAL SUBSIDIES FOR UP TO 15 YEARS TO THOSE INDIAN FAMILIES WHO MAY NEED ADDITIONAL ASSISTANCE IN ORDER TO PAY THE REQUIRED RENT. IN ADDITION, WE

ARE PROPOSING LEGISLATION TO EXPAND THE SCOPE OF THE COMMUNITY DEVELOPMENT BLOCK GRANT PROGRAM TO MAKE NEW CONSTRUCTION AN ELIGIBLE ACTIVITY FOR ALL ELIGIBLE RECIPIENTS INCLUDING INDIAN TRIBES. I WILL DISCUSS THIS PROPOSAL FURTHER IN THE COMMUNITY DEVELOPMENT PORTION OF THIS STATEMENT.

OPERATING SUBSIDIES

FEDERALLY FUNDED OPERATING COSTS FOR PUBLIC HOUSING AUTHORITES HAVE INCREASED FROM $28 MILLION IN 1970 TO THE ALMOST $1.3 BILLION REQUIRED IN FEDERAL OPERATING SUBSIDIES IN 1983. THE CURRENT PFS FORMULA HAS BEEN EMPLOYED SINCE THE MID-1970'S. UNFORTUNATELY, USE OF THE FORMULA HAS NOT LED TO ITS INTENDED RESULTS. BECAUSE IT IS BASED ON HISTORICAL COSTS, THE FORMULA HAS REWARDED INEFFICIENCIES. ALSO, EVEN WITH THE ENORMOUS INCREASE IN FUNDING FOR OPERATING SUBSIDIES, PUBLIC HOUSING AUTHORITIES HAVE NOT BEEN ABLE TO MANAGE BOTH THE DAY-TO-DAY DEMANDS OF THEIR PROJECTS AND TAKE CARE OF THE REPAIRS AND REPLACEMENTS NEEDED FOR THE SMOOTH OPERATION OF ANY PROJECT.

UNDER OUR NEW PROPOSAL, THE AMOUNT PAID TO EACH PHA WOULD BE BASED UPON THE FAIR MARKET RENTS FOR THE PARTICULAR MARKET AREA, WHICH WOULD BE SET AT THE 40TH PERCENTILE OF RENTS FOR ALL EXISTING UNITS IN THE MARKET AREA WHICH MEET THE SECTION 8 HOUSING QUALITY STANDARDS, EXCEPT THOSE BUILT IN THE LAST TWO YEARS.

THE FMR APPROACH PROVIDES AN OBJECTIVE STANDARD AGAINST WHICH THE COSTS OF OPERATING AND MAINTAINING PUBLIC HOUSING CAN BE MEASURED BY HUD, THE PHA, TENANTS, AND THE CONGRESS. UNDER THE NEW PROPOSAL, EACH PHA WOULD RECEIVE THE SUM OF THE FMRS FOR THE NUMBER OF OCCUPIED, STANDARD QUALITY UNITS OF EACH SIZE IN ITS INVENTORY, MINUS PROJECTED TENANT RENTS, AND MINUS THE DEBT SERVICE PAYMENT MADE BY HUD UNDER ANNUAL CONTRIBUTIONS CONTRACTS. THE DEBT SERVICE DEDUCTION FOR EACH UNIT WOULD BE LIMITED TO

20 PERCENT OF THE FMR, IN ORDER TO ENSURE THAT PHAS DO NOT LOSE NEW BUILDINGS FROM THE STOCK AND HAVE AS MUCH INCOME AVAILABLE FOR EXPENSES OTHER THAN DEBT SERVICE AS PRIVATE OWNERS OF OLDER RENTAL HOUSING. IN ADDITION, THE DEPARTMENT IS CONSIDERING POSSIBLE ADJUSTMENTS TO ASSURE THE ADEQUACY OF THE FMRS, SUCH AS ADJUSTMENT FOR THE COSTS ASSOCIATED WITH HIGH-RISE FAMILY PROJECTS.

FOR EACH PHA, THE AMOUNT OF SUBSIDY DETERMINED IN ACCORDANCE WITH THIS FMR APPROACH WOULD BE COMPARED WITH THE AMOUNT THE PHA WOULD RECEIVE UNDER THE CURRENT PFS FORMULA, PLUS A REPLACEMENT ALLOWANCE CALCULATED AT 20 PERCENT OF THE CURRENT NON-UTILITIES OPERATING COSTS. FOR MANY PHAS, THIS COMPARISON WOULD PROVIDE THE PHA WITH A "WINDFALL"--THAT IS, MORE SUBSIDY UNDER THE FMR FORMULA THAN UNDER THE PFS FORMULA PLUS THE REPLACEMENT ALLOWANCE. WHERE THIS OCCURS, THE PHA'S SUBSIDY WOULD BE BASED UPON THE LOWER (PFS-BASED) AMOUNT IN 1984. FOR OTHER PHAS, THE FMR FORMULA WOULD GIVE THE LOWER AMOUNT, AND IN THESE CASES, THE PHA'S SUBSIDY WOULD BE BASED UPON THE FMR CALCULATION.

IF A PHA'S FMR-BASED SUBSIDY WOULD BE LESS THAN THE SUBSIDY AVAILABLE TO THEM UNDER THE PFS FORMULA PLUS THE REPLACEMENT ALLOWANCE, THE PHA WOULD RECEIVE AT LEAST 95 PERCENT OF THE TOTAL OPERATING FUNDS THAT WOULD HAVE BEEN AVAILABLE TO THEM UNDER THE PFS FORMULA PLUS THE REPLACEMENT ALLOWANCE. THIS "TRANSITION" FUNDING LEVEL WOULD BE PHASED DOWN IN 1985 AND SUBSEQUENT YEARS UNTIL THE PHA'S MARKET RENT SUBSIDY LEVEL IS REACHED.

SOME PHAS WILL BE ABLE TO IMPROVE THEIR OPERATIONS BY REMOVING UNITS WHICH CANNOT BE REHABILITATED IN A COST-EFFECTIVE MANNER FROM THE INVENTORY. AT THIS TIME, WE EXPECT THAT SOME 100,000 UNITS, WHERE AFFORDABLE LOW-INCOME HOUSING IS AVAILABLE IN THE COMMUNITY, WILL BE ELIMINATED FROM THE PUBLIC HOUSING INVENTORY, EITHER THROUGH SALE OR DEMOLITION OF ALL OR PARTS OF PROJECTS, OVER THE NEXT SEVERAL YEARS. I THINK IT IS IMPORTANT TO STRESS

THAT THE REMOVAL OF THESE UNITS FROM THE INVENTORY IS NOT A RESULT OF THE NEW FUNDING SYSTEM, BUT WOULD OCCUR UNDER ANY OPERATING SUBSIDY SYSTEM AS THE RESULT OF LOCAL PHA DECISIONS.

I BELIEVE THAT THIS NEW FUNDING SYSTEM WOULD BENEFIT PUBLIC HOUSING TENANTS, BECAUSE IT IS A SYSTEM WHICH REWARDS EFFICIENCY AND EFFECTIVENESS IN PROJECT MANAGEMENT AND RESULTS IN IMPROVED LIVING CONDITIONS FOR THE TENANTS. IN ADDITION, REPLACING THE CURRENT MODERNIZATION PROGRAM WITH A REPLACEMENT ALLOWANCE MEANS THAT ALL DECISIONS ON THE USE OF THESE FUNDS FOR REPAIRS AND REPLACEMENTS CAN BE MADE EXPEDITIOUSLY AT THE LOCAL LEVEL, WHERE TENANTS CAN VOICE THEIR OPINIONS ON WHAT WORK ITEMS ARE NEEDED.

WE BELIEVE OUR PROPOSED CHANGES IN THE FUNDING OF BOTH OPERATING AND CAPITAL COSTS OF PUBLIC HOUSING WILL ESTABLISH REASONABLE AND OBJECTIVELY MEASURABLE BASES FOR FUTURE FUNDING, CREATE STABILITY IN RESOURCE LEVELS, PERMIT GREATER FLEXIBILITY IN PHA PLANNING AND BUDGETING, AND STRENGTHEN THE PROGRAM.

THIS REFORM OF PUBLIC HOUSING FUNDING IS NOT A BUDGET-CUTTING EXERCISE. AS A MATTER OF FACT, WE ARE ASKING FOR MORE MONEY THAN WE WOULD HAVE FOR THE OLD PERFORMANCE FUNDING SYSTEM FOR OPERATING SUBSIDIES. AFTER SEVERAL YEARS, THE NEW FUNDING SYSTEM WILL START SAVING MONEY COMPARED WITH A CONTINUATION OF SEPARATE OPERATING SUBSIDIES AND MODERNIZATION PROGRAMS. I AM WILLING TO ASK YOU FOR THESE EXTRA FUNDS AT THE OUTSET BECAUSE I FIRMLY BELIEVE THAT THIS REFORM WILL RESULT IN BETTER PUBLIC HOUSING FOR THE FAMILIES WHICH LIVE THERE.

PUBLIC HOUSING MODERNIZATION

THE 1984 BUDGET FOR ANNUAL CONTRIBUTIONS FOR ASSISTED HOUSING REFLECTS THE USE OF $2.6 BILLION OF BUDGET AUTHORITY IN 1983 AND $1.4 BILLION OF

BUDGET AUTHORITY IN 1984 FOR PUBLIC HOUSING MODERNIZATION. MODERNIZATION ACTIVITY IN 1983 INCLUDES THE USE OF $89 MILLION OF BUDGET AUTHORITY DEFERRED FROM 1982 FOR THE MODERNIZATION OF VACANT, UNINHABITABLE PUBLIC HOUSING UNITS. WHILE THE MODERNIZATION PROGRAM HAS HELPED MANY PHAS IN CARRYING OUT LONG-OVERDUE REPAIRS AND THE REPLACEMENT OF OBSOLETE EQUIPMENT, THE UNCERTAIN FUNDING AND THE COMPLEX AND TIME-CONSUMING NATURE OF THE PROGRAM DISCOURAGE EFFICIENT USE OF FEDERAL FUNDS. THE ARTIFICIAL SEPARATION OF ROUTINE MAINTENANCE AND REPAIRS FROM MODERNIZATION ACTIVITIES PREVENTS PHAS FROM MAKING COST-EFFECTIVE TRADEOFFS BETWEEN MAINTENANCE AND CAPITAL IMPROVEMENTS.

AS I HAVE INDICATED, STARTING IN 1984, WE ARE PROPOSING THAT FUTURE CAPITAL REPLACEMENT NEEDS OF PUBLIC HOUSING PROJECTS BE FUNDED FROM PUBLIC HOUSING OPERATING SUBSIDIES. THE ADMINISTRATION'S PROPOSAL WOULD REVISE THE PRESENT SYSTEM OF SUBSIDIZING OPERATING COSTS AND FUNDING PUBLIC HOUSING BY PROVIDING FOR A SINGLE PAYMENT FOR BOTH OPERATING COSTS AND A REPLACEMENT ALLOWANCE.

I RECOGNIZE, OF COURSE, THAT THE PUBLIC HOUSING STOCK STILL HAS A BACKLOG OF REPAIR AND REPLACEMENT NEEDS WHICH HAVE RESULTED FROM A SYSTEM IN WHICH PUBLIC HOUSING AUTHORITIES HAVE NOT AUTOMATICALLY RECEIVED FUNDS TO MEET THESE NEEDS. WE ARE, THEREFORE, PROPOSING A TOTAL OF $3.45 BILLION IN BUDGET AUTHORITY FOR A "TRANSITION" MODERNIZATION PROGRAM OVER THE NEXT FOUR YEARS, INCLUDING $1.4 BILLION IN FISCAL YEAR 1984. THESE MODERNIZATION FUNDS WOULD PERMIT THE PHAS TO BRING THEIR PUBLIC HOUSING STOCK UP TO STANDARD CONDITION AND MAKE ENERGY-SAVING CAPITAL IMPROVEMENTS. THIS PROCEDURE WILL HELP TO REDUCE UTILITY AND MAINTENANCE COSTS FOR PHAS AS WELL AS INCREASE THE LONG-TERM VIABILITY OF THE HOUSING STOCK SO THAT THEY CAN OPERATE SUCCESSFULLY UNDER THE NEW FUNDING SYSTEM.

PUBLIC HOUSING FINANCING

THE DEPARTMENT PROPOSED TO SELL LONG-TERM BONDS IN THE PRIVATE MARKET AT FEDERALLY-TAXABLE INTEREST RATES BEGINNING IN 1983. IN ORDER TO ACCOMPLISH

THIS, IT WAS FURTHER PROPOSED THAT $1,414,000,000 OF "ANNUAL CONTRIBUTIONS FOR ASSISTED HOUSING" BUDGET AUTHORITY WHICH WAS ENACTED IN 1983 BE USED IN SUPPORT OF SUCH SALES IN 1983 AND 1984. HOWEVER, UNDER THE TERMS OF P.L. 98-8, THE DEPARTMENT IS DIRECTED TO USE $405,000,000 IN SUPPORT OF TAX-EXEMPT SALES. ORIGINALLY, ALL LONG-TERM OBLIGATIONS WERE SOLD AS TAX-EXEMPT BONDS AND SOLD IN THE PRIVATE MARKET AND MORE RECENTLY PUBLIC HOUSING LONG TERM OBLIGATIONS WERE SOLD TO THE FEDERAL FINANCING BANK. SINCE NO ADDITIONAL BUDGET AUTHORITY HAS BEEN PROVIDED BY THE CONGRESS TO SUPPORT SALES TO THE FEDERAL FINANCING BANK, I AM PROPOSING A RETURN TO SALES IN THE PRIVATE MARKET.

HOUSING FOR THE ELDERLY OR HANDICAPPED

THE BUDGET PROPOSES LOAN RESERVATIONS OF $476 MILLION IN 1984 FOR THE SECTION 202 HOUSING FOR THE ELDERLY OR HANDICAPPED PROGRAM. THIS IS EXPECTED TO SUPPORT 10,000 NEW OR SUBSTANTIALLY REHABILITATED UNITS IN CONJUNCTION WITH THE SECTION 8 PROGRAM. ALSO, THE BUDGET ASSUMES THE SALE TO THE PRIVATE SECTOR OF CERTAIN OUTSTANDING SECTION 202 LOANS STARTING IN 1983. THE SALES PROCEEDS, WHICH ARE ESTIMATED TO BE $546.4 MILLION IN 1983 AND $792.3 MILLION IN 1984 WOULD BE USED TO REPAY OUTSTANDING TREASURY BORROWINGS.

NONPROFIT SPONSOR ASSISTANCE

NO APPROPRIATION IS BEING REQUESTED FOR THE NONPROFIT SPONSOR ASSISTANCE PROGRAM SINCE LOAN AMOUNTS CAN BE FUNDED FROM REPAYMENTS OF PRIOR YEAR LOANS. HOWEVER, A LOAN LIMITATION OF $1.9 MILLION FOR 1984 IS BEING REQUESTED IN ORDER TO ENABLE THE DEPARTMENT TO CONTINUE TO CARRY OUT THIS PROGRAM OF ASSISTANCE TO SPONSORS OF SECTION 202 PROJECTS.

HOMEOWNERSHIP ASSISTANCE

WE ARE NOT PROPOSING ANY NEW FUNDING IN 1984 FOR THE SECTION 235 HOMEOWNERSHIP ASSISTANCE PROGRAM. BALANCES OF AUTHORITY REMAINING AVAILABLE WILL BE UTILIZED IN SUPPORT OF 9,000 UNIT RESERVATIONS IN 1983. EXCEPT FOR LIMITED STATUTORY EXCEPTIONS, THE RESERVATION PHASE OF THE PROGRAM

EXPIRES ON MAY 20, 1983; UNDER NO CIRCUMSTANCES IS THE DEPARTMENT AUTHORIZED TO ENTER INTO ANY NEW OBLIGATIONS AFTER SEPTEMBER 30, 1983.

RENT SUPPLEMENT PROGRAM

THE 1984 RENT SUPPLEMENT PROGRAM INCLUDES THE ANTICIPATED RECAPTURE OF AN ESTIMATED $113.7 MILLION OF CONTRACT AUTHORITY AND $2.4 BILLION OF BUDGET AUTHORITY AS A RESULT OF THE EXPECTED CONVERSION OF UP TO 65,000 INSURED RENT SUPPLEMENT UNITS TO SECTION 8 ASSISTANCE.

THE CONVERSION OF RENT SUPPLEMENT ASSISTED UNITS TO SECTION 8 ASSISTANCE PROVIDES A LONG-TERM SOLUTION TO THE EXISTING PROBLEM OF INADEQUATE FUNDING TO AMEND CONTRACTS FOR PROJECTS WITH RENT SUPPLEMENT UNITS. OF THE TOTAL TO BE RECAPTURED, $93.3 MILLION OF CONTRACT AUTHORITY AND $2.4 BILLION OF BUDGET AUTHORITY ARE BEING PROPOSED FOR RESCISSION. THE REMAINING $20.4 MILLION WILL BE UTILIZED FOR ONE YEAR TO PROVIDE NECESSARY RENT INCREASES FOR THE INSURED RENT SUPPLEMENT UNITS REMAINING UNDER CONTRACT WHICH WILL BE CONVERTED TO SECTION 8 ASSISTANCE DURING 1984.

RENTAL HOUSING ASSISTANCE

THE BUDGET PROPOSES THAT DURING 1983 AND 1984 THE DEPARTMENT WILL CONVERT 13,000 RENTAL ASSISTANCE PROGRAM (RAP) UNITS IN PROJECTS INSURED UNDER THE NATIONAL HOUSING ACT, AS AMENDED, TO THE SECTION 8 PROGRAM. CONVERSIONS ARE EXPECTED TO TOTAL 5,000 UNITS IN 1983 AND 8,000 UNITS IN 1984. NON-INSURED STATE-AIDED PROJECTS WILL BE EXEMPTED FROM THE CONVERSION POLICY AND WILL CONTINUE TO RECEIVE SUBSIDY ASSISTANCE AT EXISTING FUNDING LEVELS UNDER THE RAP PROGRAM. THE CONVERSION OF RAP UNITS WILL RESULT IN THE RECAPTURE OF CONTRACT AUTHORITY AND BUDGET AUTHORITY. A SMALL AMOUNT OF THIS AUTHORITY WILL BE UTILIZED TO PROVIDE NEEDED AMENDMENTS TO UNITS NOT YET CONVERTED WITH THE REMAINING BALANCE OF AUTHORITY PROPOSED FOR RESCISSION.

HOUSING PAYMENTS

FOR 1984, THE BUDGET PROPOSES AN APPROPRIATION OF $10.7 BILLION FOR THE HOUSING PAYMENTS ACCOUNT TO PROVIDE PAYMENTS FOR APPROXIMATELY 3.9 MILLION UNITS. THIS AMOUNT DOES NOT COUNT AS BUDGET AUTHORITY, BUT IS AN APPROPRIATION TO LIQUIDATE THE LEGAL PAYMENT COMMITMENTS FOR UNITS UNDER CONTRACT. THE APPROPRIATION COVERS LIQUIDATION PAYMENTS FOR SUBSIDIZED HOUSING PROGRAMS AND INCLUDES SUBSIDY PAYMENTS FOR SECTION 8, PUBLIC HOUSING, SECTION 235, SECTION 236, RENT SUPPLEMENT AND COLLEGE HOUSING DEBT SERVICE GRANTS.

MORTGAGE AND LOAN INSURANCE

THE RESURGENCE OF A HEALTHY HOUSING INDUSTRY IS ALREADY WELL UNDERWAY AND IT HAS CONTRIBUTED SIGNIFICANTLY TO THE ONGOING ECONOMIC RECOVERY. THE BUDGET RECOGNIZES THE IMPORTANCE TO THE ECONOMY OF A HEALTHY HOUSING INDUSTRY AND PROPOSES A CONTINUATION OF THE SUBSTANTIAL LEVELS OF CREDIT SUPPORT THAT CURRENTLY ARE BEING MADE AVAILABLE TO THIS SECTOR. THE BUDGET PROPOSES A $39.8 BILLION LIMITATION ON GROSS COMMITMENTS FOR MORTGAGE AND LOAN INSURANCE IN 1984. THIS LIMITATION IS EXPECTED TO SUPPORT MORTGAGE INSURANCE APPLICATIONS FOR 700,000 SINGLE FAMILY HOMES AND 117,000 MULTI-FAMILY UNITS.

IN ADDITION, A WIDE RANGE OF LEGISLATIVE PROPOSALS HAVE BEEN SUBMITTED TO THE CONGRESS WHICH ARE DESIGNED TO BETTER FOCUS THE MORTGAGE INSURANCE ACTIVITIES OF THE FEDERAL GOVERNMENT TO THOSE GROUPS, SPECIFICALLY FIRST-TIME HOMEBUYERS AND INNER CITY RESIDENTS, WHO CANNOT BE FULLY SERVED BY THE PRIVATE MARKET. THESE CHANGES WILL RESULT IN AN EXPANSION IN HOMEOWNERSHIP OPPORTUNITIES FOR THESE GROUPS BY COMPLEMENTING THE ACTIVITIES ALREADY UNDERWAY IN THE CONVENTIONAL MARKET.

SPECIFICALLY, THE DEPARTMENT IS PROPOSING TO CHANGE THE MINIMUM DOWNPAYMENT REQUIREMENTS FOR INSURED MORTGAGES BY REDUCING THE HOMEBUYER'S CASH REQUIREMENT ON HOME PURCHASES UNDER $50,000 AND INCREASING THE CASH REQUIRED ON PURCHASES HIGHER THAN THAT AMOUNT. IN ADDITION, WE ARE PROPOSING

DEMONSTRATION PROGRAMS FOR THE INSURANCE OF SHELL HOMES AND HOME EQUITY CONVERSION MORTGAGES. WE ALSO ARE REQUESTING AUTHORITY TO PROVIDE INSURANCE FOR NEW FINANCING MECHANISMS INCLUDING ADJUSTABLE RATE MORTGAGES (ARMS) AND SHARED APPRECIATION MORTGAGES (SAMS). THE DEPARTMENT ALSO PROPOSES TO ELIMINATE THE SECRETARY'S AUTHORITY TO SET INTEREST RATE CEILINGS FOR INSURED LOANS.

WE ALSO ARE PROPOSING A DIRECT LOAN LIMITATION OF $56.4 MILLION UNDER THE TEMPORARY MORTGAGE ASSISTANCE PAYMENTS (TMAP) PROGRAM FOR 1984 FOR PAYMENTS ON BEHALF OF HOMEOWNERS WHO HAVE SUFFERED TEMPORARY LOSS OF INCOME DUE TO CIRCUMSTANCES BEYOND THEIR CONTROL. THE BUDGET HAD ASSUMED THE PROGRAM WOULD BE OPERATIONAL THIS SPRING; HOWEVER, IMPLEMENTATION OF THE DEPARTMENT'S OPERATING REGULATIONS PRESENTLY IS ENJOINED BY COURT ORDER IN FERRELL V. PIERCE.

TO REIMBURSE THE FHA FUND FOR ACTUAL LOSSES EXPERIENCED IN 1982, WE ARE REQUESTING A $253 MILLION APPROPRIATION FOR 1984. THESE FUNDS WILL BE USED TO PAY MORTGAGE AND LOAN INSURANCE CLAIMS AND OTHER OPERATING EXPENSES IN 1983 AND ALSO TO REPAY PART OF THE OUTSTANDING TREASURY BORROWINGS. AS YOU KNOW, THESE APPROPRIATIONS HAVE ALLOWED THE DEPARTMENT TO HOLD THE LINE ON ADDITIONAL TREASURY BORROWINGS OVER THE YEARS AND THEREBY REDUCE THE STEEP RISE IN INTEREST COSTS TO THE FHA FUND. THIS HAS HELPED TO ENSURE THE FINANCIAL SOUNDNESS OF THE FUND.

TROUBLED PROJECTS/FLEXIBLE SUBSIDY PROGRAM

FUNDING FOR THE TROUBLED PROJECTS/FLEXIBLE SUBSIDY PROGRAM WILL BE PROVIDED IN 1984 BY USING UNOBLIGATED BALANCES ESTIMATED TO BE CARRIED OVER FROM 1983 AND TRANSFERS FROM THE RENTAL HOUSING ASSISTANCE FUND. NO NEW APPROPRIATION IS REQUESTED. THESE FUNDS WILL BE USED TO ADDRESS THE COMPREHENSIVE NEEDS OF AN ESTIMATED 110 FINANCIALLY TROUBLED PROJECTS IN 1984 AND KEEP THEM FROM GOING INTO DEFAULT AND/OR FORECLOSURE.

GOVERNMENT NATIONAL MORTGAGE ASSOCIATION

MORTGAGE-BACKED SECURITIES PROGRAM

THE GREAT SUCCESS IN THE GROWTH AND DEVELOPMENT OF THE SECONDARY MARKET FOR MORTGAGE FINANCING IS PRIMARILY DUE TO THE INNOVATIVE CHARACTER OF THE MORTGAGE-BACKED SECURITIES PROGRAM. WE PROPOSE THE CONTINUATION OF THE MORTGAGE-BACKED SECURITIES PROGRAM IN 1984 AT A LEVEL OF $58.7 BILLION OF COMMITMENTS ISSUED. THIS LEVEL OF ACTIVITY IS EXPECTED TO RESULT IN $39.1 BILLION OF ISSUES GUARANTEED.

THE PROPOSED COMMITMENT LEVEL REFLECTS A DECREASE OF $9.6 BILLION FROM THE ESTIMATED 1983 COMMITMENT LEVEL. THE LEVEL PROPOSED FOR 1984 IS REALISTIC BASED UPON THE ESTIMATED LEVELS OF LOANS PROJECTED TO BE ACTUALLY INSURED BY FHA OR GUARANTEED BY VA IN 1984. IT SHOULD BE NOTED THAT THE CALCULATION OF THE REQUESTED COMMITMENT LIMIT IS BASED SOLELY ON A MATHEMATICAL RELATIONSHIP, CALCULATED FROM PAST EXPERIENCE, BETWEEN FHA AND VA VOLUME AND GNMA ACTIVITY.

TERMINATION OF TANDEM PROGRAMS

WE ARE REQUESTING NO NEW COMMITMENT AUTHORITY FOR THE GNMA TANDEM MORTGAGE PURCHASE PROGRAMS IN 1984. THE BUDGET WHICH WE ARE SUBMITTING PROPOSES THE ENACTMENT OF LEGISLATION TERMINATING THIS PROGRAM. THE LOSSES GENERATED FROM THE SALE OF BELOW-MARKET RATE LOANS IN THE FORM OF DISCOUNTS ABSORBED BY THE DEPARTMENT UNDER THE TANDEM PROGRAM HAVE RESULTED IN SIGNIFICANT LONG-TERM COSTS TO THE GOVERNMENT. THESE COSTS REPRESENT A SUBSTANTIAL FRONT-END SUBSIDY WHICH WE CAN NOT AFFORD. THE TANDEM PROGRAMS IN ADDITION TO BEING EXCEEDINGLY COSTLY ARE POORLY TARGETED AND OFTEN PROVIDE SUBSIDIES TO PEOPLE NOT TRULY IN NEED OF HELP IN ACQUIRING DECENT HOUSING.

DEBT FORGIVENESS

We are proposing in the 1984 Budget the enactment of legislation authorizing the forgiveness of noncollateralized Treasury borrowing for the GNMA Tandem Mortgage Purchase program and the Emergency Mortgage Purchase Assistance program, with the assets and liabilities of the respective programs being proposed for transfer to the Management and Liquidating Functions Fund beginning in fiscal year 1984.

The enactment of debt forgiveness legislation would substantially reduce the amount of interest due the Treasury and, as a result, reduce the outlay and budget authority requirements for the Department in 1984 and future years. The outlay savings from debt forgiveness in 1984 are estimated at $687.9 million under the Tandem program and $154.5 million for the Emergency Mortgage Purchase Assistance program. Further savings are projected in these accounts for each of the subsequent years.

Debt forgiveness is an important adjustment to the Federal accounts needed in order to accurately recognize that a substantial amount of the debt owed to the Treasury under these accounts can never be otherwise paid-off.

SOLAR ENERGY AND ENERGY CONSERVATION BANK

Moving now to the Solar Bank, the Budget proposes that no additional authority be enacted for the Solar Bank program in 1984. We continue to believe that substantial economic incentives already exist for solar and energy conservation improvements. The Budget also proposes that unobligated balances in 1983 be transferred to the Low-Income Home Energy Assistance program in the Department of Health and Human Services (HHS). Under the HHS program, a portion of funds may be used for the provision of energy conservation assistance.

For those funds already appropriated, the Department has moved swiftly to implement the program through states and make the Solar Bank operable. The Department intends to obligate all of the fiscal year 1982 appropriation, as directed by court order, as well as approximately $9 million of the 1983 appropriation. The latter estimate assumes Congressional approval of the proposal to transfer an estimated $11 million to the Department of Health and Human Services. If this proposal is not accepted, the full 1983 appropriation will be made available for obligation.

Community Development Block Grants

For the Community Development Block Grant program, we are requesting $3.5 billion. Two of the Department's major initiatives are related to the CDBG program, the first of which is a proposal that adds new housing construction as an eligible activity under Title I. This proposal will give block grant recipients, including Indian tribes funded under the Secretary's Discretionary Fund, the flexibility to determine the extent to which funds are to be used for housing construction or community development activities. The second initiative is the proposal to better address the needs of Indian tribes. Within the appropriation requested for 1984, we propose to expand the level of Block Grant assistance to Indian tribes. They will receive $75 million as part of the Secretary's Discretionary Fund, an increase of $44 million over the level of funding provided for Indians in 1983. These funds may be used to complement Indian tribes. They will receive $75 million as part of the Secretary's Discretionary Fund, an increase of $44 million over the level of funding provided for Indians in 1983. These funds may be used to complement assistance for housing construction to be provided to Indians under the new "Indian Housing Grants" program. Total funding for the Secretary's Discretionary Fund in 1984 is $100.5 million, which also includes grants to territories and technical assistance to states and local governments to improve the administration of the CDBG and UDAG programs.

THE REMAINING BLOCK GRANT FUNDS, APPROXIMATELY $2.4 BILLION FOR ENTITLEMENT AND $1 BILLION FOR THE STATE SMALL CITIES PROGRAM, WILL ENABLE US TO CONTINUE TO PROVIDE THE LEVEL OF FUNDING NECESSARY TO MAINTAIN ECONOMICALLY AND SOCIALLY VIABLE COMMUNITIES IN THIS COUNTRY. ENTITLEMENT FUNDING OF $2.4 BILLION IN 1984 WILL ASSIST APPROXIMATELY 780 METROPOLITAN CITIES AND URBAN COUNTIES IN FURTHERING THE NATIONAL OBJECTIVES SET FORTH UNDER TITLE I. THE ESTIMATE OF 780 ENTITLEMENT CITIES AND COUNTIES IS REVISED UPWARD FROM THE EARLIER ESTIMATE OF 740 INCLUDED IN THE BUDGET SUBMISSION. THIS REVISION REFLECTS CHANGES IN THE DEFINITION OF METROPOLITAN STATISTICAL AREA (MSA) DESIGNATED BY THE OFFICE OF MANAGEMENT AND BUDGET, AS THE RESULT OF 1980 CENSUS DATA. ONE EFFECT OF THE NEW DATA IS THE CREATION OF ADDITIONAL CENTRAL CITIES. ESTABLISH NEW LINKAGES WITH THE PRIVATE SECTOR. THE REQUEST OF $1 BILLION WILL SUPPORT AN ESTIMATED 50 STATES, PLUS PUERTO RICO, IN OPERATING THEIR SMALL CITIES PROGRAMS AT CURRENT LEVELS.

ALL BLOCK GRANT RECIPIENTS ARE EXPECTED TO MAXIMIZE BENEFITS FROM CDBG FUNDS BY UTILIZING OTHER LOCAL PUBLIC AND PRIVATE RESOURCES. IN THIS ENDEAVOR, WE ENCOURAGE RECIPIENTS TO CONTINUE TO ESTABLISH AND MAINTAIN LOCAL PUBLIC/PRIVATE PARTNERSHIPS.

URBAN DEVELOPMENT ACTION GRANTS

THE BENEFIT OF SUCH PARTNERSHIPS IS APTLY DEMONSTRATED IN THE POPULAR UDAG PROGRAM, WHICH USES FEDERAL DOLLARS TO LEVERAGE OTHER PUBLIC AND PRIVATE RESOURCES FOR ECONOMIC DEVELOPMENT PROJECTS IN DISTRESSED AREAS. ACTION GRANTS CONTINUE TO LEVERAGE APPROXIMATELY $5.90 FOR EACH DOLLAR OF ACTION GRANT FUNDS AWARDED. THIS PROGRAM HAS BEEN INSTRUMENTAL IN CREATING NEW PERMANENT JOBS, RETAINING JOBS THAT OTHERWISE WOULD BE LOST, AND PROVIDING CONSTRUCTION JOBS. THE AVERAGE UDAG COST FOR EACH JOB CREATED IS $7,700. LOCAL GOVERNMENTS CAN ALSO COUNT ON THIS PROGRAM TO PROVIDE ADDITIONAL PROPERTY AND OTHER TAX REVENUES. FOR 1984 WE ARE REQUESTING AN APPROPRIATION OF $196 MILLION.

URBAN HOMESTEADING

WE BELIEVE THAT THE URBAN HOMESTEADING PROGRAM IS ANOTHER EFFECTIVE MEANS TO IMPROVE EXISTING HOUSING STOCK AND PROMOTE NEIGHBORHOOD REVITALIZATION. THEREFORE, WE ARE PROPOSING A $12 MILLION APPROPRIATION FOR THIS PROGRAM IN 1984. OF THIS APPROPRIATION REQUEST, $3 MILLION IS TO BE USED FOR THE PROPOSED MULTIFAMILY HOMESTEADING DEMONSTRATION. THIS PROPOSED PROGRAM WILL BE USED TO SPUR LOCAL INTEREST IN ADDRESSING THE PROBLEM OF DETERIORATED MULTIFAMILY HOUSING STOCK THROUGH THE HOMESTEADING OF HUD-HELD MULTIFAMILY PROPERTIES. WE EXPECT THE REMAINING $9 MILLION OF THIS APPROPRIATION TO SUPPORT THE CONVEYANCE AND HOMESTEADING OF 818 SINGLE FAMILY UNITS, AT AN AVERAGE OF $11,000 EACH. ALSO, THE PROPOSED MULTIFAMILY HOMESTEADING DEMONSTRATION WILL ALLOW FOR THE TRANSFER OF AN ESTIMATED 15 BUILDINGS AVERAGING 30 UNITS EACH, FOR A TOTAL OF 450 DWELLING UNITS TO BE HOMESTEADED.

RENTAL REHABILITATION GRANTS

THE DEPARTMENT IS ALSO RESUBMITTING A PROPOSAL FOR THE RENTAL REHABILITATION GRANTS PROGRAM IN 1984. PENDING THE ENACTMENT OF AUTHORIZING LEGISLATION, WE ARE REQUESTING $150 MILLION FOR SUPPORT OF THIS PROGRAM, UNDER WHICH ASSISTANCE WILL BE PROVIDED TO STATES AND UNITS OF GENERAL LOCAL GOVERNMENTS FOR REHABILITATION OF PRIVATELY OWNED PROPERTIES LOCATED IN LOW- AND MODERATE-INCOME AREAS TO BE USED FOR RESIDENTIAL RENTAL PURPOSES. OUR APPROPRIATION REQUEST WOULD SUPPORT THE REHABILITATION OF AN ESTIMATED 30,000 UNITS, AT AN AVERAGE GRANT OF $5,000 PER UNIT. WITH ADDITIONAL MATCHING FUNDS FROM OTHER PUBLIC/PRIVATE SOURCES, WE EXPECT AN ESTIMATED TOTAL REHABILITATION EFFORT OF $300 MILLION.

THIS NEW INITIATIVE WILL BE LINKED TO THE NEW SECTION 8 HOUSING PAYMENT CERTIFICATE PROGRAM. REHABILITATION ASSISTANCE WILL BE TARGETED TO LOW-INCOME NEIGHBORHOODS WHERE THE MARKET RENTS FOR A REHABILITATED UNIT FALL WITHIN THE PAYMENT STANDARD FOR THE SECTION 8 HOUSING PAYMENT CERTIFICATE PROGRAM. THIS IS A NEW APPROACH TO COORDINATING PRODUCTION SUBSIDIES WITH

RENTAL ASSISTANCE, THEREBY USING, RATHER THAN SUPPLANTING, THE FREE MARKET. WE ARE CONFIDENT THAT THIS APPROACH WILL PRODUCE A SUFFICIENT NUMBER OF AFFORDABLE UNITS FOR LOW- AND MODERATE-INCOME PERSONS.

TERMINATED PROGRAMS

OUR 1984 BUDGET PROPOSALS CALL FOR THE TERMINATION OF BOTH THE SECTION 108 LOAN GUARANTEE AND SECTION 312 REHABILITATION LOAN PROGRAMS. WE RECOMMEND TERMINATION OF THE SECTION 108 LOAN GUARANTEE PROGRAM IN SUPPORT OF THE ADMINISTRATION'S OVERALL EFFORT TO REDUCE MARKET DISTURBANCES CAUSED BY FEDERAL GUARANTEES. WE ALSO RECOMMEND TERMINATION OF THE SECTION 312 PROGRAM, AS IT IS BEING REPLACED WITH THE MORE EFFECTIVE AND EFFICIENT PROPOSED RENTAL REHABILITATION GRANTS PROGRAM.

NEW COMMUNITY DEVELOPMENT CORPORATION

MR. CHAIRMAN, THIS TIME LAST YEAR I REPORTED THAT WE WERE WELL ON THE WAY TO MEETING OUR OBJECTIVE OF LIQUIDATING THE NEW COMMUNITY DEVELOPMENT CORPORATION BY THE END OF FY 1983. I CAN NOW CONFIRM THAT EXPECTATION WILL BE REALIZED.

YOU WILL RECALL, THE DEBT OF 13 COMMUNITIES WAS GUARANTEED AND 3 MORE COMMUNITIES WERE QUALIFIED ELIGIBLE FOR THE ALLOCATION OF CERTAIN BENEFITS. AT JANUARY 20, 1981, 9 OF THE 13 COMMUNITIES ENJOYING GUARANTEES HAD FAILED AND THEIR ASSETS HAD BEEN ACQUIRED BY HUD. IN SATISFACTION OF THE GUARANTEE PROVISION, HUD WAS PAYING THE DEBT SERVICE OF 3 COMMUNITIES UNABLE TO SATISFY THE OBLIGATION THEMSELVES AND WITH NO PROSPECT OF BEING ABLE TO DO SO; ONE COMMUNITY WAS A SUCCESS.

TO DATE HUD HAS SOLD SUBSTANTIALLY ALL OF THE ASSETS OF 8 OF THE 9 ACQUIRED COMMUNITIES; SOLD ITS INTEREST IN THE 3 COMMUNITIES NOT MEETING THEIR DEBT SERVICE; AND, BY THE END OF FY 1983, WE WILL HAVE TERMINATED THE FEDERAL GOVERNMENT'S RELATIONSHIP TO THE ONE SUCCESSFUL PROJECT AND 2 OF THE 3 COMMUNITIES ELIGIBLE FOR BENEFIT ALLOCATION.

In summary, the 1984 Budget proposals contemplate:

- Liquidation of the New Communities Fund and transfer of NCDC's remaining assets and liabilities to the Department's Revolving Fund for Liquidating Programs account;
- Forgiveness of the New Communities Fund debt to the U.S. Treasury; and
- Termination of the New Communities program.

POLICY DEVELOPMENT AND RESEARCH

An appropriation of $18 million is requested in 1984 for the Research and Technology account to carry out the Department's research program. We will continue to emphasize the improvement of the efficiency, effectiveness and equity of the Department's programs as well as the development of practical alternatives to these programs.

Particular areas on which we will continue to focus include:

- research and analyses directed toward increasing the efficiency and effectiveness of assisted housing programs, including reforms of existing programs and evaluation of alternative programs;
- analyses of: (1) Federal housing finance programs, including the role of alternative mortgage instruments, (2) financial institution regulation and reform, and (3) alternative tax and other financial incentives for housing;
- analyses of new or improved alternatives for urban economic development, including the Administration's Enterprise Zone program, the Community Development Block Grant and the Urban Development Action Grant programs;

- WAYS TO REDUCE THE COMPONENT COSTS OF HOUSING (DEVELOPMENT, BUILDING, FINANCIAL, AND OPERATING COSTS);
- DEVELOPMENT AND DISSEMINATION OF INFORMATION ABOUT BETTER METHODS FOR CITY MANAGEMENT AND DELIVERY OF LOCAL GOVERNMENT SERVICES, INCLUDING ALTERNATIVE INSTITUTIONAL MODELS FOR THE DELIVERY OF PUBLIC SERVICES;
- IDENTIFICATION OF SUCCESSFUL NEIGHBORHOOD STRATEGIES AND DEVELOPMENT OF GUIDANCE MATERIALS ON COMMUNITY GROWTH STRATEGIES; AND
- WAYS TO PROMOTE MORE EFFECTIVE ENFORCEMENT OF THE FAIR HOUSING LAWS AND TO MAKE VOLUNTARY COMPLIANCE A MORE EFFECTIVE STRATEGY FOR ACHIEVING FAIR HOUSING.

FAIR HOUSING AND EQUAL OPPORTUNITY

WE ARE REQUESTING $4.7 MILLION FOR THE FAIR HOUSING ASSISTANCE PROGRAM (FHAP) IN 1984, WHICH IS $1 MILLION LESS THAN 1983. OF THIS TOTAL, $3.7 MILLION WILL BE PROVIDED TO STATE AND LOCAL AGENCIES WHICH ARE RECOGNIZED AS SUBSTANTIALLY EQUIVALENT UNDER TITLE VIII OF THE CIVIL RIGHTS ACT OF 1968. THE FUNDS WILL BE UTILIZED TO ENHANCE AGENCIES' CAPABILITY TO PROCESS COMPLAINTS AND WILL ALSO PROVIDE TECHNICAL ASSISTANCE AND TRAINING TO AGENCIES' STAFF. THE REMAINING $1.0 MILLION WILL BE PROVIDED TO COMMUNITY HOUSING RESOURCE BOARDS (CHRBS) WHICH ASSIST THE DEPARTMENT IN DEVELOPING AND IMPLEMENTING VOLUNTARY AFFIRMATIVE MARKETING PROGRAMS. A REDUCED LEVEL OF FUNDING IS REQUESTED IN RECOGNITION OF THE UNOBLIGATED BALANCES AVAILABLE TO THE CHRB COMPONENT OF THE PROGRAM. THE CHRB FUNDING, TOGETHER WITH FUNDING FOR THE STATE AND LOCAL AGENCIES, PROVIDES AN EFFECTIVE WAY OF ALLOWING STATES AND LOCAL AGENCIES AND PRIVATE GROUPS TO FORM A PARTNERSHIP WITH HUD IN ENFORCING THE FAIR HOUSING LAW.

IN 1984, OUR EFFORTS PURSUANT TO TITLE VI AND SECTION 109 WILL CONTINUE TO EXPAND. THE QUALITY AND IMPACT OF COMPLIANCE REVIEWS AND

COMPLAINT INVESTIGATIONS WILL INCREASE. EMPHASIS IS BEING PLACED ON NEGOTIATED SETTLEMENTS IN CASES OF APPARENT NONCOMPLIANCE.

OUR SYSTEMIC DISCRIMINATION UNITS WILL CONTINUE TO INVESTIGATE COMPLAINTS OF DISCRIMINATION WHICH ARE PERVASIVE AND INSTITUTIONALIZED IN NATURE. IN THOSE CASES WHERE CONCILIATION CAN NOT BE ACHIEVED, THE INVESTIGATIVE REPORTS WILL BE SUBMITTED TO THE DEPARTMENT OF JUSTICE.

ALSO, STAFF HAVE AND WILL CONTINUE TO WORK VERY CLOSELY WITH THE STATE ADMINISTERED SMALL CITIES COMMUNITY DEVELOPMENT BLOCK GRANT PROGRAM TO ENSURE NON-DISCRIMINATION IN THE DELIVERY OF SERVICES.

THESE ACTIVITIES WILL BE ACCOMPLISHED WITHOUT ANY INCREASE IN OUR REQUESTED STAFFING LEVEL, WHICH IS 558 PERMANENT POSITIONS, THE SAME LEVEL AS IN 1983.

DEPARTMENTAL MANAGEMENT

OUR 1984 FUNDING REQUEST FOR SALARIES AND EXPENSES IS $580.7 MILLION A DECREASE OF $12.9 MILLION FROM THE CURRENT 1983 ESTIMATE OF $593.6 MILLION. THE 1983 ESTIMATE INCLUDES A REQUEST FOR A $10 MILLION PAY RAISE SUPPLEMENTAL.

THE MAJOR REASON FOR THE DECREASE IN THE FUNDING REQUEST IS DUE TO THE REDUCTION IN STAFF REQUIREMENTS. OUR 1984 STAFFING REQUEST IS FOR 11,791 FULL-TIME PERMANENT PERSONNEL, A DECREASE OF 1,138 FROM THE 1983 ESTIMATE OF 12,929. MOST OF THE DECREASE IS IN THE AREA OF HOUSING PROGRAMS WHICH HAVE BEEN REDUCED IN ACCORDANCE WITH OVERALL PROGRAM LEVELS. ADMINISTRATION SUPPORT STAFF HAVE ALSO BEEN REDUCED BASED ON OVERALL STAFFING LEVELS.

MR. CHAIRMAN, THAT CONCLUDES MY PREPARED STATEMENT. I WILL BE HAPPY TO ANSWER ANY QUESTIONS YOU MAY HAVE.

SUMMARY STATEMENT

Senator GARN. If you would like to proceed.

Secretary PIERCE. All right, Mr. Chairman. I would like to make a few comments.

Mr. Chairman, it is again my pleasure to appear before you, this time to present the 1984 budget proposals of the Department of Housing and Urban Development. Last year I stated the administration's basic premise was, and today continues to be, that in the long run, the only real solution to meeting this Nation's housing needs is to bring inflation under control and for interest rates to drop to more realistic levels. I stated further that the President's economic recovery program had just begun to take effect and that interest rates could be expected to decline once the financial marketplace believes that we will stick to our program to lick inflation.

Well, Mr. Chairman, if I may be excused for boasting just a little, the results are in and our faith has been vindicated. Inflation is well on its way to being licked and interest rates have declined sharply. These are results for which all of us can be justly proud and for which both the administration and the Congress can share credit. At the end of calendar year 1981, the annual rate of inflation was down to 8.9 percent. It had been cut further to 6.8 percent by this time last year, dropped to 3.9 percent by the end of 1982, and the downward trend has continued.

Over the past year, interest rates on single-family FHA home mortgages have declined from 15.5 percent to 11.5 percent. These numbers translate into real life, meaningful benefits to the American economy and homebuyers.

As this committee is well aware, Mr. Chairman, FHA-mortgage insurance activity has been setting records in recent months, with applications for single-family insurance running at nearly 70,000 per month for the first half of fiscal year 1983. This level of activity is up more than 200 percent over the same period of 1 year earlier.

HOUSING STARTS

Moreover, housing starts for the first 3 months of calendar year 1983 are up 82 percent over the same period of 1982. For all of calendar year 1982, starts were less than 1.1 million, while 1983 starts are expected to be in a range of 1.5 to 1.7 million, plus 250,000 units of manufactured housing. A further measure of the improving economy, as it impacts on housing production, can be seen in the number of building permits issued by local governments. For the first quarter of calendar year 1983, the number of permits issued were up 75 percent over the same quarter of 1982.

Increased housing production on the part of the private sector means housing opportunity, jobs, and a healthy economy. We are greatly encouraged by the clear signs of economic recovery; yet we recognize fully the responsibility of government to address the housing needs of the poor as well. We do not believe that these needs must, or should be, met through a large and costly subsidized housing production program. Instead, we propose a program which addresses the key issue—affordability.

PROPOSED HOUSING VOUCHERS

Our proposal for housing payment certificates, or vouchers, is designed to help poor people afford good housing located within the total community, not isolated in projects. Our budget proposes approval of 120,000 certificates in 1984, including 80,000 targeted to assist additional families. The Senate Banking Committee has again endorsed this concept and is recommending an authorization of some 58,000 certificates, 40,000 of which would be tied to the rental rehabilitation initiative being considered by that committee.

We consider the certificate proposal the most humane, most socially positive, and most cost-effective means of meeting the shelter needs of our Nation's poor. The concepts behind the certificate program are straightforward:

—A housing payment certificate is issued by a local public housing authority to a family or an individual eligible for housing assistance.

—The certificate enables the family to shop for decent, safe, and sanitary rental housing and guarantees payment to the landlord for a portion of the rent.

—The certificate offers a shopping incentive. This means the family receiving assistance may choose the amount it desires to spend for shelter, as well as where it wishes to reside. HUD will pay the difference between 30 percent of the family's adjusted gross income and a rent standard for a given area. The family may choose to rent for less than this standard level and pocket the savings, or it is free to spend more, should it choose to do so.

—Generally, sufficient decent rental housing is available in the private market for certificate holders. But a supporting program of rental rehabilitation grants is proposed to increase the supply of usable units in low- and moderate-income areas.

At this point, Mr. Chairman, I would like to highlight some of the key figures and proposals included within our budget request.

HIGHLIGHTS OF BUDGET REQUEST

For 1984, the budget, as originally submitted, proposed net budget authority of $4.1 billion. This included approximately $7 billion in new budget authority offset by $2.9 billion in rescissions under the section 236 and rent supplement programs. The budget authority request subsequently has been increased by $3.1 billion to allow the Department to continue its efforts to convert rent supplement and section 236 RAP units to section 8. This additional $3.1 billion is the result of the Congress disapproving the deferral of $3.1 billion of 1983 funds.

Other major elements within the total budget request for 1984 include $1.6 billion for public housing operating subsidies, $3.5 billion for community development block grants—including $75 million for Indian assistance—$196 million for urban development action grants, $150 million for the proposed rental rehabilitation grant program, and $76 million for the proposed Indian housing grant program.

These budget proposals may be compared to actions taken thus far by the Senate Banking Committee on the Department's 1984 budget. These actions include a proposed authorization of $7.65 billion in budget authority for assisted housing, including $2 billion for modernization. The committee would also authorize $1.5 billion for public housing operating subsidies and $3.966 billion in budget authority for community development, including $440 million for urban development action grants. They also would provide $850 million for the rental rehabilitation program, including $550 million for housing payment certificates, which they are tying to the units rehabilitated.

BUDGET OUTLAYS

As for outlays, the budget initially projected $13.7 billion in 1984, compared with $14.8 billion for 1983, a decrease of $1.1 billion. These estimates have subsequently been revised to reflect the effects of the recently enacted jobs bill. The revised 1984 estimate is $14.3 billion, which is $855 million less than the revised estimate for 1983.

EMPLOYMENT

Fiscal year 1984 employment will decline to an estimated 11,791 full-time permanent employees from 12,929 at the end of 1983 and 13,828 actual employees at the end of 1982. These reductions are based on lower program levels in 1983 and 1984 and more efficient use of staff, particularly in the area of single-family mortgage insurance. In the aggregate, these staffing reductions should be effected essentially through attrition. To the extent workload imbalances occur, selective hirings and reduction-in-force actions may be necessary.

PUBLIC HOUSING OPERATING SUBSIDY

One of our major housing program initiatives is our proposal for public housing operating subsidies. The 1984 appropriation request of more than $1.6 billion reflects a major reform in the method of calculating operating subsidy requirements. Major elements of the proposal include: (1) Computing operating subsidy and capital improvement requirements based on local fair market rents for existing housing; (2) a replacement allowance for routine maintenance and major repairs; and (3) transition modernization funding to finance immediate capital improvements, particularly energy conservation improvements necessary to correct substandard housing conditions and thereby reduce operating costs.

Budget authority for the transition modernization element, amounting to $1.4 billion in 1984, is included within the annual contributions for assisted housing account and is in addition to the more than $1.6 billion requested under the operating subsidy account. For the vast majority of the 2,800 public housing agencies, the impact of these proposals should be a total subsidy equal to or higher than that which they now receive under the existing performance funding system.

INDIAN HOUSING PROGRAM

Early in my tenure at HUD, the significant and unique problems of Indians were brought to my attention. I made a commitment at that time to do something about these problems and engaged in wide-ranging discussions within the administration about Indian housing. Our 1984 legislative package includes both an Indian housing program and an Indian community development block grant program to help meet Indian housing and infrastructure needs.

A cornerstone of the Indian housing program will be the use of single-family FHA insurance. This insurance will make home ownership available to Indians who do not presently have access to private financing, as do other Americans, due to the unique status of Indian trust lands. In addition, HUD is requesting $76 million in budget authority for the Indian housing program. These funds will be used to facilitate the construction and supporting infrastructure needs of 1,500 homes and to make certificates available for very low-income families.

The second program, the Indian community development block grant program, will be funded from the Secretary's discretionary fund, which would be increased by $44 million, for a total funding level of $75 million for Indian tribes. New construction would also become an eligible activity in the use of these funds.

The additional CDBG funding for Indian tribes is included within the total block grant request of $3.5 billion. This means we propose to continue funding the remainder of the program at $3.456 billion, the same level as 1983, excluding the special $1 billion add-on for unemployment. In addition, we propose a $196 million appropriation for urban development action grants. Let me emphasize, Mr. Chairman, the strong continuing support of this administration to meet the community and economic development needs of the Nation's cities and towns through the use of CDBG, UDAG, and other programs.

RENTAL REHABILITATION GRANTS

The 1984 budget again proposes enactment of a rental rehabilitation grant program at a funding level of $150 million. This proposal would permit the rehabilitation of approximately 30,000 rental units and is an essential component of our overall program to help provide decent and affordable rental housing for families assisted through housing certificates.

URBAN HOMESTEADING

Another community development initiative is the proposal to expand the urban homesteading program to include multifamily housing. Here, too, we are resubmitting a proposal first made last year but not acted upon by this committee in the absence of authorizing legislation. Of the $12 million appropriation request, $3 million would be earmarked for the multifamily demonstration.

FAIR HOUSING

Finally, the budget requests $4.7 million for the fair housing assistance program under the title VIII fair housing legislation. This includes $3.7 million to reimburse State and local agencies for processing discrimination complaints and $1 million to assist community housing resource boards in helping the Department implement voluntary affirmative marketing programs. You can be assured of our continuing commitment to the goals of title VIII.

I will submit a more detailed statement for the record. Now, I would be happy to respond to any questions that you may have.

MULTIFAMILY HOUSING STARTS

Senator GARN. Thank you very much, Mr. Secretary.

I take it from your opening statement that you are as encouraged as I am by the upswing in the single-family housing market. To what extent has there been a corresponding increase in the number of multifamily housing starts?

Secretary PIERCE. There has been a corresponding increase; not as much as the single-family housing, but it has been increasing. The exact statistics, if you would like, we will supply for the record.

Senator GARN. We would appreciate it if you would do that.

[The information follows:]

HOUSING STARTS

The table below presents a comparison between the rate of construction start for the first 3 months of 1983 and the comparable period in 1982. The data are based upon Bureau of the Census reports and represent actual data, not seasonally adjusted rates of activity.

[In thousands of units]

	Single-family units		Multifamily units	
	1982	1983	1982	1983
January	29.3	56.3	13.4	28.6
February	32.5	59.7	14.3	30.2
March	50.6	84.9	21.5	39.4
First quarter total	112.4	200.9	49.2	98.2

FHA INSURANCE COMMITMENT LIMITATION

Senator GARN. In fiscal year 1983, you requested an FHA limitation of $35 billion. In the fiscal year 1983 appropriations bill, the Congress increased this to $39.8 billion. Three months after this bill was signed you requested, and I proposed, an amendment to increase the limit by $6.1 billion, for a new total of $45.9 billion. Where are you currently in terms of the fiscal year 1983 limitation?

Secretary PIERCE. I think we are in a position of about $26 billion, in the vicinity of $26 billion. But we may have to come back and ask for some more.

Senator GARN. For fiscal year 1984 you are requesting $39.8 billion. Given a housing recovery, continued high demand for mortgage refinancing, and the authorization of new FHA insurance programs, will the $39.8 billion ceiling on new insurance commitments be adequate for meeting projected housing demand in fiscal year 1984?

Secretary PIERCE. According to our people, it will be. They expect there to be less of a surge in the building of housing, less demand for the use of FHA commitments. But we are not absolutely sure of that. We will watch it closely and, again, if necessary, report to the Congress and ask for an increase in the cap.

PRESIDENT'S COMMITMENT TO FAIR HOUSING

Senator GARN. During his State of the Union Address, the President referred to the issue of civil rights and stated:

> Effective enforcement of our Nation's fair housing laws is also essential to insuring equal opportunity. In the year ahead, we will work to strengthen enforcement of fair housing laws for all Americans.

What do you intend to do during fiscal year 1984 to fulfill the President's commitment?

Secretary PIERCE. We are working with various organizations, such as the National Association of Realtors and others, to try to influence people to engage in fair housing practices. We also are taking complaints and trying to counsel people so they will be able to get fair housing. We also are working with State and local governments that have laws that we think are similar to what the Federal law requires, and we are submitting cases to them for conciliation and trial, if necessary. We will be doing a substantial amount of that.

In addition, we plan to submit legislation that has been drafted, but for various reasons we have not been able to have a meeting with the President as yet on this. It is scheduled to be presented to them a few days from now. Hopefully, he will accept that and will pass it on to the Congress. If Congress enacts the proposed legislation, it will strengthen the existing Federal fair housing laws.

FUNDING DECREASE—FAIR HOUSING ASSISTANCE

Senator GARN. In light of this commitment in the President's statement, how do you explain the decrease in fair housing funding from $5.7 million to $4.7 million in your fiscal year 1984 request?

Secretary PIERCE. That was done by the Assistant Secretary for Fair Housing. He said we were not able to spend as much money as we thought we would last year. He wanted also to see how well the money was being spent with the so-called CHRB organizations and how efficiently they were operated before we spent any more money.

So, at his suggestion, we took less money this year. We may come back for more next year.

Senator GARN. But you feel with this renewed commitment that $4.7 million is adequate?

Secretary PIERCE. According to my assistant, he feels it is adequate. He has been watching the program, and I am satisfied with his judgment.

UNITS UNDER PAYMENT THROUGH 1988

Senator Garn. Last month I asked you to prepare a set of tables showing the number of funded units in the pipeline that will become available during the next 5 years.

The tables reveal that the total number of units eligible for payment in fiscal year 1983 will be about 3.7 million. With the completion of units in the pipeline and offsetting opt outs, demolitions, and terminations, the number of units under assistance in fiscal year 1988 would also be about 3.7 million.

This does not include any additional units you might propose in your fiscal year 1984-88 budgets. In fact, your budget proposal would add 90,000 units to the fiscal year 1984 column.

What are the Department's long-term goals relative to the number of units under assistance or the percent of the needy that can be served?

Secretary Pierce. Actually, we expect to have by the end of 1985 more than 4 million households receiving Federal assistance. According to our research, there are about 9 million elderly and families who are eligible to receive Federal housing assistance, and we think that by the end of 1984, or sometime during 1984, about 40 percent of those will be served and will be receiving Federal assistance.

I hasten to add that there has never been a time in this country's history when all of the people who qualified for assistance have received assistance. I believe we are doing the very best we can, considering the fact that we must reduce the cost of Government spending. That is absolutely essential in order to turn around our economy, which is most important for the benefit of all the people of this country.

HOUSING NEED

Senator Garn. The construction of new housing for low-income families is deemed too costly. Such programs would be almost entirely replaced by demand side subsidies—housing payment certificates—to be used in lower priced but standard quality housing. Not only would additional commitments under section 8 new construction and substantial rehabilitation programs be halted, but new funding for the tandem program of financing low- and middle-income housing construction would be ended. Moreover, the Department is encouraging the conversion of units from current housing assistance programs such as rent supplements and section 8 existing housing.

Against this background and the requirement to reduce Federal spending, it becomes extremely important to assess the extent of our Nation's housing needs and how they might be addressed. As a first step in this direction, on February 3, I asked you to prepare some data on our housing needs using a model developed by this subcommittee.

The analysis reveals that there are approximately 800,000 very low income renters with worst-case housing problems; that is, families living in physically inadequate housing and having a rent burden of over 30 percent. Included are some 100,000 large families and 200,000 elderly households. Although these are large numbers, they are manageable when compared to the over 9 million families below the 50th percentile of median income. This is one way of defining housing needs and identifying a target population for Federal assistance.

Do you feel the Department has a better way of assessing housing needs?

Secretary PIERCE. Well, I would not disagree that this certainly is a way of doing it, and certainly according to that formula you reach people who are living in inadequate housing and, as I understand it, pay more than 30 percent of their adjusted gross income toward rent. These are definitely people who need help.

However, I have difficulty with this because if we set out at this time to segregate out those 800,000 people and start building especially for them, I think it would be a very hard job to do. I think it would be extremely costly and very difficult to handle administratively. So I agree that we can find these people and they are in very poor financial condition, but I do not see how we could start a program just to take care of those 800,000.

Also, I don't know how many of these 800,000 are already taken care of by the section 8 existing program or some other Federal housing assistance program, or whether they are taken care of by some adequate city/State program. It is very difficult to put your hand on that.

So my answer, I think, basically, is that it is an interesting fact and it is important to know, but I do not think that we could start a program just based on that fact.

HOUSING ASSISTANCE TO SERVE MOST NEEDY

Senator GARN. Well, in looking at the model, of course, the attempt was to define the most serious problem areas. My experience in housing is we pick some arbitrary figures, such and such a percentage of median income, and everybody below that needs housing. Therefore, we see these vastly inflated programs that have produced some of the problems that you inherited on that assumption.

Now, nowhere in that model did we talk about building 800,000 units for 800,000 people. As a matter of fact, this type of analysis indicates that you have about 350,000 units that become available due to vacancies each year. There is that kind of turnover.

So I don't want to be misunderstood, that we are simply talking about building or finding new units for that number of people. We are trying to concentrate on the most needy with that 350,000 turnover.

So my next question would be, do you have any means or suggestions to make in terms of targeting those units, the 350,000 that turn over?

Secretary PIERCE. Yes. I think that what we ought to do is—this is an interesting concept, but I don't think we have gone far enough with it. I think we have to find out more about these 800,000. Where are they, for example? That might make a lot of difference. To what extent could you possibly put them into units that become vacant?

I think there is a lot of work to do before we decide what kind of program we should have to satisfy the need of these 800,000 people. So my suggestion would be to allow us to do further research on this to see how practical it would be to design a program to help those 800,000 people.

HOUSING ASSISTANCE FOR THOSE IN INADEQUATE HOUSING

Senator GARN. Well, I certainly recognize there is more work that needs to be done on it. But I think you know, Mr. Secretary, my entire work in the housing area has been trying to, especially with limited budgets, target those who are most in need of adequate housing. This is because we have seen too many examples of people who are on the programs who require assistance, and then we see a lot of people that are in very difficult straits that are just not living in adequate housing at all.

I have never understood why we couldn't target our housing programs better to help those who really do not have adequate housing, rather than helping some who would like better housing than they currently have.

Do you have any idea what proportion of individuals currently entering assisted housing units would be classified as worst case?

Secretary PIERCE. That would be part of I think what we would really have to look at. I am sure that it is a considerable number, but exactly what it would be I think we would have to check and do research on because we have set our standard at below 50 percent of the median income and, in some instances, below 80 percent of the median income. So that would be part of the research that we would have to do.

UNITS ADDED TO INVENTORY IN 1984

Senator GARN. Our model indicates that we might need to add 112,000 units per year to the housing inventory in order to address the worst-case households over the next 5 years. How many units does your budget anticipate adding to the inventory during fiscal year 1984?

Secretary PIERCE. How many did you say that would be?

Senator GARN. 112,000 is an estimate from the model.

Secretary PIERCE. In fiscal year 1984, well, we are not going to get what we asked for.

What is our estimate on that?

Mr. ABRAMS. We are asking for 80,000 housing payment certificates and 10,000 units under the 202 program for the elderly and handicapped.

Secretary PIERCE. And there are also some in the pipeline for public housing, right?

Mr. ABRAMS. Yes, sir.

Secretary PIERCE. So I would say it would come to around 100,000.

ADDITIONAL HOUSING FOR ELDERLY, INDIANS, LARGE FAMILIES, AND RURAL

Senator GARN. Our analysis also indicates a need for 19,400 more units for the elderly, 10,000 units for Indians, 11,100 units for large families, and 18,300 for rural housing.

How does your fiscal year 1984 proposal compare to these needs in terms of additional units?

Secretary PIERCE. Let me ask my housing assistant what he has on that.

Mr. ABRAMS. On the Indian housing program we have about 15,000 units in the pipeline under the current public housing program which we are working at getting built and occupied.

Senator GARN. You haven't requested any new ones?

Mr. ABRAMS. We have requested the two programs—the expansion of community development block grant funds to provide for up to 1,500 new units and the housing categorical grant combined with certificate programs—which could provide up to 1,500 housing units. But there is a lot of discretion given to the tribal governments in both of those programs. So there could be anywhere between 2,000 and 4,000 units produced for Indian housing.

For the elderly, in addition to the 202 program and the 10,000 units we have requested for particularly those areas where the needs can't be met through the existing housing stock, the existing certificate program has proven to be the most effective way, in many instances, of providing housing for the elderly because they can stay in place, as many prefer to, and receive a program that addresses their affordability needs while they stay in place. Forty percent of the current families on certificates are elderly households.

With regard to the large families, again the section 8 and public housing new development programs did a very poor job in terms of housing large families. Both programs concentrated on small units or elderly units. Although there is a need for them, they didn't concentrate on the worst-case large family households because they are not as profitable for a private developer or as easy to manage for either a private developer or a housing authority.

Again, the certificate program has been the most effective way of serving large families because they do, in many instances, rent single-family houses or go into the existing housing stock of one- to four-family houses that have large bedroom units.

The problem, as we have noted before in testimony at the Banking Committee, is that it has become difficult for large families to utilize the certificate. I think only 50 percent of the large families were able to utilize the certificate issued to them within 2 months.

The Secretary has directed us to make certain that the housing payment certificate program works more effectively for large families. We are looking into means of raising the fair market rents for three-, four-, and five-bedroom units, so there will be an additional incentive for the private sector to make those units available for large families.

HOUSE APPROPRIATION SUBCOMMITTEE ASSISTED HOUSING UNITS

Senator GARN. As you know, in the House markup last week they provided 116,000 units. Do you believe that this is an excessive number?

Secretary PIERCE. 116,000 units? No, I cannot say that it is an excessive number. Actually, everybody thinks they picked the best. We think that what we asked for was exactly right. But I can't say that 116,000 units would be excessive.

UPDATE OF HOUSING NEED MODEL

Senator GARN. Mr. Secretary, in preparation for next year's hearing, I would appreciate it if you could help us update this model and these charts, see how effective they can be, and if we can do a better job of targeting.

Secretary PIERCE. We will certainly do that, Mr. Chairman. We will work it out and see if a feasible program could be devised to take care of the 800,000 most needy families.

Senator GARN. Senator D'Amato?

PRESERVATION OF SECTION 202 PROGRAM

Senator D'AMATO. Thank you very much, Mr. Chairman.

I don't wish to embarrass my esteemed colleague and Chairman, Senator Garn, but I feel obligated—and maybe we can take this out of the record if necessary—to say that sometimes we really don't realize what we have when we get involved in parochial sectionalism. But, the fact is that Senator Garn's leadership has assured the retention of the 202 program, along with Secretary Pierce's help. It has come under tremendous assault.

Jake, this may hurt you back in Utah, my saying this to you, you know. [Laughter.]

The fact is, though, I just think it is a great program, and were it not for your leadership, the additional 4,000 units that were put in last year would not have been put in. It is a great program. The average income for those senior citizens who utilize that program is something slightly in excess of $4,000 a year. It is a humane program. I would submit it is a program that saves this Nation—and I hope Mr. Stockman gets the message—saves us money. The program also exemplifies fiscal restraint. Most of those people would be on the public welfare rolls and many of them would end up in extended care facilities; that is, medicare, medicaid. They would drive up the costs much faster. So it is humane. It is thoughtful. It saves money.

Again, Mr. Chairman, I want to thank you for your leadership in preserving that program.

Senator GARN. I appreciate that. I got a compliment the other day from the senior Senator from New York. I don't want anyone in Utah to find out that either one of you said nice things. [Laughter.]

Senator D'AMATO. Could you strike that from the record, then? [Laughter.]

RENTAL REHAB PROGRAM/RENT CONTROL

Mr. Secretary, in these very difficult times, turbulent times, I want to commend you and your staff for your tireless efforts in attempting to balance the needs and the competing factors of interest in this area. Your staff has been most cooperative—I know that comes under your leadership—in dealing with a number of problems, particularly as they relate to large metropolitan areas, New York in particular.

Just recently, Mr. Secretary, the Banking Committee approved its 1983 HUD authorization legislation. In title I of that bill, the Senate's rental rehab program, a clause was included which would prohibit any agreements or local requirements regarding rents from attaching to any structure assisted under that rehab title. Consequently, anyone who came to—for example, the city of New York—with a rental rehab program would not be permitted to operate under the rent stabilization laws or the prevailing local laws. Thus, Mr. Secretary, the clause effectively preempts local rent control or stabilization law as a precondition to the receipt of these Federal rehab funds.

I have been informed by the city that, as a result, they would not be able then to participate in this program, a program that will probably involve upward of 40,000 rental rehab units, which would be a terrible loss to housing stock, which would bring about further deterioration, et cetera.

Now, I am rather familiar with this issue because, in 1981, it was this Senator who proposed something even a little broader than that. You responded to a number of interest groups in a letter dated July 1981. I will just read one paragraph:

> I think that the local governments should be able to make their own rules with respect to rent control. Their decisions should not cause HUD to have a policy of refusing to go into their areas.

Is that still the Department's view with regard to interference by the Congress into local matters which should best be left to the local area?

Secretary PIERCE. Yes, that is still our view.

Senator D'AMATO. Very good. I will compose a letter to you then requesting that you reaffirm that particular theory.

STATE-AIDED RENT SUPPLEMENT CONVERSIONS

Mr. Secretary, I applaud the Department's efforts in attempting to deal with the rent supplement program, although there has been some controversy in regard to that program. I have some questions with respect to the rent supplement and rental assistance programs. The Department has excluded from their conversion policy nearly 33,000 rent supplement, or RAP units, in State-financed, uninsured section 236 projects.

Now, in spite of the fact that this Congress has clearly indicated that it is their intent that these units also receive rental assistance payments when their rents go up, this has not been the case. I understand we have great pressure from OMB on this issue. But can you explain to us why, in spite of the fact that Congress has clearly spelled this out, these units are being excluded from receiving rent payment increases. I understand that we are going to have some defaults as a result of this policy.

Secretary PIERCE. I have brought to the table my General Counsel. We discussed this yesterday. I would like for him to answer this.

Mr. Knapp?

DEPARTMENT'S OBLIGATION TO AMEND STATE-AIDED UNITS

Mr. KNAPP. Senator, as you know from the prior correspondence between yourself and the Secretary, on the question of exactly how clear Congress has been with respect to the obligation to amend rent supplement and RAP contracts, that is exactly where the disagreement is. We have examined the statutes, the development of the legislative history from before 1974, in 1974, and subsequently. We simply don't find that obligation in those programs in the same way that we clearly do find the obligation in the section 8 program.

That is the starting point, the way we view the law now. Then, although what I have just said applies equally to both the insured and the noninsured programs, our Department has a separate interest in the insured programs, which is the protection of the insurance funds, which has led the Department to choose to amend or convert agreements covering insured projects.

POTENTIAL DEFAULT OF STATE-AIDED UNITS

As far as the last part of your question is concerned, concerning whether we have defaults, I think, as the Secretary noted in his correspondence with you, that that question contains a kind of misapprehension of the purpose of the two subsidy programs which we are talking about. These are not full assistance programs covering a project as a whole. They really were economic integration subsidy programs only, intended to cover a portion of the units in the program, generally 20 percent or so, so that that number of units could be available to low-income tenants needing the deep subsidy. It did not provide a subsidy for the balance or larger part of units in the project. So that if a project had difficulty at the unassisted rent level in meeting its expenses, those programs really wouldn't address the problem of that project.

So we don't think that there will be project defaults resulting from the stance we are taking as to the State agency projects.

LEGISLATIVE BASIS FOR NOT AMENDING STATE-AIDED UNITS

Senator D'AMATO. Inasmuch as you did do some research on this, you would obviously then be familiar with the fact that in the joint continuing resolution of last year—Joint Resolution 631—both House and Senate report language forcefully and clearly reaffirmed our legislative intent and directed HUD to fund all necessary amendments in rental assistance payments for both FHA insured and State-financed projects.

Now, John, I don't know how much clearer it can be. You can say, "Well, we want it in legislative language here." I think that we are straining not to fund amendments in the State-financed, non-FHA-insured projects.

This is going to create tremendous problems and I think that this policy is working at cross purposes with respect to our intention to preserve our existing housing stock. I do not understand it.

OMB COMMUNICATIONS ON STATE-AIDED AMENDMENTS

Have you gotten any communication from OMB on this?

Mr. KNAPP. Communication from OMB?

Senator D'AMATO. Did OMB contact you with respect to whether or not you should or should not fund the increases in non-FHA projects? That is the question.

Mr. KNAPP. The question had been put to me whether there was an obligation under the statutes to——

Senator D'AMATO. We find Mr. Stockman again.

Mr. KNAPP. Of course.

Senator D'AMATO. Of course, ah.

Mr. KNAPP. Of course, when anything comes up like that, I am frequently asked legal questions. [Laughter.]

That is not only within the Department but from the Executive Office of the President.

Senator D'AMATO. Did you get a directive from them?

Mr. KNAPP. No.

Senator D'AMATO. Did you get an advisory from them?

Mr. KNAPP. I don't get a directive to give an answer. I am asked a question.

Senator D'AMATO. Did they ask you a question, or did they send a directive? What kind of communication, if any, did you get?

Mr. KNAPP. I got an oral request during the budget preparation. I have gotten it during the last several budget cycles, I believe——

Senator D'AMATO. With respect to this area? What happened? I want to hear.

Mr. KNAPP [continuing]. As to whether or not there is an obligation to amend, either in insured or uninsured, and then whether there is a difference between the two as far as the statutory obligation is concerned.

Senator D'AMATO. Mr. Secretary, did you or anyone else receive any communication with respect to this from OMB?

Secretary PIERCE. Actually, I have knowledge of the information that Mr. Knapp is now giving you, yes.

Senator D'AMATO. I think we have provided pretty clear legislative intent. I think what we are getting down to is the fact that OMB has come in again and said, "This is the way to save some money." It is not the intent of Congress to say that the State projects should not be assisted. We are talking about people. We are talking about human beings. I don't understand it. I think it is wrong.

I want to tell you something. If you say we lack clear legislative authority, we did not spell it out, and you want to use that as the vehicle by which to thwart our intent, perhaps we are going to have to move toward correcting this problem with bill language.

LEGAL OPINION ON AMENDMENTS TO STATE-AIDED UNITS

I would like to have a legal opinion from you on this issue. I would like you to review this very carefully. I think it is important. I do not think we want to say that we apply one standard to FHA, another standard to the State non-FHA-insured projects. I really cannot believe that you would act so contrary to explicit congressional intent. Now, I do believe OMB would do that because they do not give a damn; they don't care. All they are looking at is the bottom line and how can we save money. People are out on the streets if projects get closed down, foreclosured, and so what? I have heard some of those people talk in terms of eliminating all Federal housing. They certainly don't want 202. You know that and I know that.

But I would ask you, if you would—and if you want a written request from me or the committee, that is fine—to review and submit something to us on this issue. I think it is important. I don't think that we want to lose housing when we are fighting so hard to maintain our existing stock.

Would you give me a response on that in writing?

Mr. KNAPP. I can do that, Senator. But I will tell you that in the prior exchange of correspondence that you already have had with the Secretary, the Secretary's response to you did express the legal conclusion, my legal conclusion, based on the research. It would just be the same thing in a different form. If you will ask me to just spread it out together in an opinion, I will do so, but the Secretary's response to your letter incorporates my opinion.

Senator D'AMATO. So, Mr. Secretary, then we are at that point in time when we seem we are not going to fund those increases. Is that what we are saying?

OBLIGATION TO FHA FUND VERSUS STATE-AIDED UNITS

Secretary PIERCE. Let me say we do have some difficulty with this, and maybe I will try to come at it a little differently.

You know, we do feel as though we have an obligation to protect the FHA fund. We also believe that with housing that has gone through the FHA process, we have had the opportunity to have input as to what goes into the house, how economically it is done, and how well it is constructed, and so on.

With States, we don't have that. We have never had that kind of an input. We do not know how well these houses have been constructed. So we are not as able to protect the FHA fund.

I understand from a note that I have received from Mr. Kliman, that the House Appropriations Committee has done something in this area. He suggests that we look into that more before we make any final conclusion.

Let me say this: From a practical, from a political, from a what-makes-sense point of view, I think that something here is going to have to be done. It is a matter of how we work it out. I think we will work with you in trying to do it.

We do have problems in this area from a technical point of view, from OMB, from others. But I think that we can work something out that is satisfactory.

Senator D'AMATO. Thank you very much, Mr. Secretary.

Thank you, Mr. Chairman.

LINE ITEM LEGISLATION FOR ASSISTED HOUSING

Senator GARN. Mr. Secretary, as you are well aware, and as Senator D'Amato has just been talking about, we have had a very difficult time convincing OMB that they should allocate the $8.65 billion in assisted housing in accordance with the table contained in the conference report on your fiscal year 1983 bill. Consequently, we actually put the table in the so-called jobs bill.

Now, on the House side, you testified that if we wanted to avoid this same problem in fiscal year 1984, we should once again incorporate the table into the law. But this really bothers me, because it is true that Congress can then get what it voted for and not have OMB trying to change what we told the agency to do, but at the same time it severely restricts your ability in managing the program. How do you resolve that problem? What do you recommend? How do we get OMB to do what Congress tells them to do without having to be so restrictive that it hampers your ability to manage the program?

Secretary PIERCE. That certainly is a good question and one I have thought about and worried about a long time. [Laughter.]

I would suggest this, that the legislation contain a narrative relating to a chart that is put in the report and have the narrative try to state the degree of flexibility that we have, showing that it is your intent that we have such flexibility, and make reference to the chart as a means of trying to help describe what you think it is that we should be doing.

I also think that when this is done, our staff should work with your staff, and we will pull in the OMB people so if they have any objection, I would like them to state it early on so that we will be able to get a clear understanding as to what we all are getting at, so that there will not be these difficulties that we have had in the past whereby we have had to come back to Congress, or ask the Congress to put a table into the legislation, and all that kind of thing.

Senator GARN. Well, I will hold out putting the table in until we get to conference, in the hopes that we can do something with OMB in the meantime. If we can't, if we get some unreasonableness on their part, we will have to put it in.

Secretary PIERCE. I have talked to Dave Stockman about this, and I would like to try, if we can, to have our staffs work together, pull in the OMB people and try to get this done before you go into conference, and see if we can't get it done in a reasonable way so we won't have this trouble.

Senator GARN. I would hope we could. A lot of people talk to Dave Stockman. I am not sure he listens. [Laughter.]

Between OMB and the Budget Committee, I don't know why we have any departments, any authorizing committees, or Appropriations Committees. They are all so bright, they can make all the decisions for themselves.

ANALYSIS OF PUBLIC HOUSING PIPELINE

As you know, in December the conference report on the second continuing resolution stated that no new public housing construction would be supported until progress was made on clearing the almost $9 billion public housing pipeline. Four months after that bill was passed, the Department completed the analysis of a field survey on the status of the pipeline and proposed a procedure to evaluate the reasonableness of the costs of each of the projects.

I would like to complement you, Phil, for your efforts in this regard——

Mr. ABRAMS. Thank you.

Senator GARN [continuing]. And the manner in which you coordinated this activity with the subcommittee.

Could you please provide the survey on the total development caps, the associated field memo, and the public housing survey for the record?

Secretary PIERCE. We will supply that.

[The information follows:]

ANALYSIS OF PUBLIC HOUSING PIPELINE

Following are the three inserts requested:

(1) Total Development Cost (TCD) Survey;

(2) Notice H 83-70, subject "Public Housing TDC Caps and Public Housing Project Deadlines", dated 5/3/83; and

(3) Public Housing Pipeline Survey.

SUMMARY OF PUBLIC HOUSING PROJECTS WITH BUDGETS THAT EXCEED MAXIMUM TDC'S ESTABLISHED BY THE TDC RULE

Below is a breakdown of public housing projects that exceed the maximum Total Development Cost (TDC) permitted by Notice H 83-20 on a Regional and National basis. These projects are tabulated by number of projects and units in 5 percent incremental ranges above the TDC caps. These increments are designed to provide some indication of the degree of difficulty which will be involved in negotiating the TDCs within the caps and in evaluating waiver requests.

NATIONAL	NO. PROJECTS	NO. UNITS
Incremental cost in excess of TDC		
0% - 5%	73	3314
5% - 10%	59	3428
10% - 15%	34	1450
15% - 20%	25	1312
20% - 25%	14	616
25% - 30%	8	335
30% - 35%	4	162
45% - 50%	1	60
55% - 60%	2	163
80% - 85%	1	25
245% - 250%	1	128
Region I (Boston)		
0% - 5%	2	191
5% - 10%	2	225
10% - 15%	2	72
15% - 20%	1	103
245% - 250%	1	128
Region II (New York)		
0% - 5%	7	357
5% - 10%	8	800
10% - 15%	5	304
15% - 20%	5	296
20% - 25%	1	125
25% - 30%	1	36

NATIONAL	NO. PROJECTS	NO. UNITS
Regional III (Philadelphia)		
0% - 5%	13	661
5% - 10%	4	267
10% - 15%	5	224
15% - 20%	1	90
20% - 25%	3	94
25% - 30%	1	22
30% - 35%	2	68
55% - 60%	1	43
80% - 85%	1	25
Region IV (Atlanta)		
0% - 5%	13	636
5% - 10%	12	750
10% - 15%	6	227
15% - 20%	4	276
20% - 25%	2	92
Region V (Chicago)		
0% - 5%	7	455
5% - 10%	8	278
10% - 15%	2	68
15% - 20%	3	130
20% - 25%	1	40
30% - 35%	1	18
Region VI (Dallas)		
0% - 5%	11	564
5% - 10%	4	240
10% - 15%	3	209
15% - 20%	2	80
20% - 25%	5	191
25% - 30%	1	41
30% - 35%	1	76
Region VII (Kansas City)		
0% - 5%	0	0
5% - 10%	1	31
20% - 25%	1	24
Region VIII (Denver)		
0% - 5%	5	114
10% - 15%	2	45
15% - 20%	1	56
20% - 25%	1	50

NATIONAL	NO. PROJECTS	NO. UNITS
Region IX (San Francisco)		
0% - 5%	13	264
5% - 10%	19	770
10% - 15%	7	199
15% - 20%	4	133
20% - 25%	0	0
25% - 30%	5	236
55% - 60%	1	120
Region X (Seattle)		
0% - 5%	2	72
5% - 10%	1	67
10% - 15%	2	102
15% - 20%	4	148
45% - 50%	1	60

Special Attention of:
All Regional Administrators; Directors, Offices of Regional Housing and of Indian Programs; Field Office Managers/Supervisors; and Housing/Indian Programs Division Directors

Notice H 83-20 (HUD)

Issued: 5/3/83
Expires: 5/31/85

Cross References:
7417.1, 7417.1 REV-1, and 7440.1

Subject: Public/Indian Housing TDC caps and public housing project deadlines

1. PURPOSE: The Congressional Appropriations Committees have waived their prohibition to the total development cost (TDC) caps rule contained in the Fiscal Year 1983 Continuing Resolution. HUD has assured the Congressional Committees that if a project is determined to be viable, HUD will attempt to bring the project to construction start.

   This Notice implements a review procedure for public/Indian housing projects whose total development costs (TDCs) exceed 160 percent of current project prototype cost limits (PPCL) for detached, semi detached, row or walk up projects and 145 percent for elevator high rise projects. Headquarters shall make the determination whether to terminate a project or approve a waiver of the TDC caps rule for every project that exceeds the TDC caps outlined in 24 CFR parts 804, 805 and 841, published as a final rule in the Federal Register on September 8, 1982 but not effective until December 6, 1982. The Headquarters determination regarding a project will be based on a review by a panel made up of Headquarters technical staff.

   This Notice also implements the Department's policy, enunciated in the Fiscal Year 1983 budget submission to Congress, to terminate public housing projects that have not proceeded with development in a timely manner. The detailed instructions for this policy, which is not applicable to Indian housing projects, are explained in paragraph 5.

2. APPLICATION OF TDC CAPS: The TDC caps rule applies to all public and Indian housing projects except a turnkey project for which a contract of sale had been executed or a conventional project for which a contract award had been made prior to the date of this Notice.

   For each project which cannot be brought within the TDC caps through negotiation with the public housing agency (PHA) [or Indian Housing Agency (IHA)], Field Office Managers/Supervisors must submit a project review package. Prior to submitting such a package, the Field Office must ensure that all factors contributing to costs exceeding the TDC caps have been thoroughly reviewed (e.g., identifying alternate sites for projects with excessive site costs) and all changes allowable under outstanding instructions have been proposed to the PHA/IHA. If it is determined by the Field Office that it is not feasible to bring the TDC within the caps or the PHA/IHA refuses to make suggested changes, a project review package as described in paragraph 3 will be submitted to Headquarters for a determination. No review package shall be forwarded to Headquarters until all needed supporting documentation has been thoroughly screened for completeness and accuracy.

3. DOCUMENTATION FOR TDC WAIVER OR TERMINATION: Each Field Office shall explain, in detail, the reasons why the project exceeds the caps and the rationale as to why the caps should either be waived or the project terminated. All pertinent information relating to the costs of a project and reflecting its current status must be included in the review package submitted to Headquarters. The required information shall include, but not be limited to, the following:

a. A copy of the latest budget.

b. Plans and specifications.

c. If applicable, identification of any excess management, maintenance, or community space for which costs are to be included in the TDC on which annual contributions are to be based. Include as part of the explanation, the total PHA management, maintenance, or community space currently available and/or being developed and its location in relation to the proposed project.

d. A copy of, or a statement concerning, any local ordinance that restricts the development density of the proposed site(s).

e. A copy of the applicable completed Form HUD 52651 or 52651A with any Valuation Branch comments on the recommended or approved site(s) in relation to any other sites submitted or considered for the project.

f. Copies of appraisal documents (ECO 2/3; Form HUD 92264; supporting comparable data sheets; spread sheets; copies of any comments that affect or influence the final value estimate).

g. Copies of the Cost Branch exhibits (including calculations for the project prototype cost limit, any cost adjustment factor and the recommendations and comments made during the review of the estimated cost of improvements).

h. If the processing of a project involves a combination of processing stages, copies of the cost exhibits required by the last stage of the combination.

i. Identification of each of the on-site and off-site costs included in the totals for these two items.

j. A succinct statement explaining what actions were taken or proposed to reconcile the costs in excess of the TDC "cap" and why the Field Office was unable to sufficiently reduce the project costs.

k. Any other documentation or statement which supports the Field Office recommendation.

4. HEADQUARTERS REVIEW PROCEDURE: Each element of a review package will be individually and collectively reviewed for the effect each has on the project costs and the joint impact on the project TDC. The review will consider costs in relation to the reasonableness of the over-all planning, site, site improvements and design. Upon completion of the review, Headquarters will make the final determination as to whether to grant a waiver or terminate the project. The Department will waive the TDC caps rule where the Headquarters review panel determines that all feasible alternatives have been considered and that the project cannot be reasonably completed within the TDC limits. Where the Headquarters panel determines that a waiver should not be granted, the PHA/IHA will be notified and given 10 days to respond. If the final decision is to not grant the waiver, the Field Office shall be advised to terminate the project, and if the project is under ACC to make a finding of substantial breach under Section 507(5) of the Annual Contributions Contract (ACC), and to notify the PHA/IHA of the final decision. Thereafter, the Field Office shall follow the procedures described in paragraph 5e for termination of the project, amendment of the ACC and recapture of project funds. Since the final determination may not be appealed by the Field Office, it is important that each review package contain all pertinent information.

5. TERMINATION OF PUBLIC HOUSING PROJECTS EXCEEDING DEADLINES:

a. For every public housing project in the preconstruction pipeline, Field Offices are to immediately advise the PHA in writing that, unless granted an exception by Headquarters, the project will be terminated and funds recaptured immediately if it fails to start construction by the later of the PHA-projected start date, if any, identified in the HUD pipeline survey (see attachment to recapture/reuse policy issued separately) or the negotiated date identified by paragraph 5b below.

b. For every public housing project in the preconstruction pipeline, Field Offices are to immediately negotiate a deadline date as follows:

(1) if the site(s) for the project has been approved by HUD (final site approval or approval of site acquisition documents) as of the date of this Notice, a construction start must be achieved by a PHA no later than the PHA/HUD mutually agreed upon start date (see attachment to recapture/reuse policy) not to exceed one year from the date of this Notice; or

(2) if the site(s) for the project has not been approved by HUD as of the date of this Notice, the site(s) must be identified and approved by HUD by a date which has been mutually agreed upon by the PHA and HUD. This site approval deadline shall not exceed nine months from the date of this Notice. Upon HUD site approval, a construction start must be achieved within one year from the date of HUD site approval.

c. For any projects under executed ACC, the initial letter to the PHA shall state that if the project fails to meet the applicable site approval and/or construction start deadline, the PHA may be found to be in substantial breach of the ACC (as defined in Section 507 of the ACC), the project terminated in accordance with Section 509 of the ACC, and funds recaptured by the Field Office immediately.

d. Headquarters will consider Field Office requests for exceptions to this policy only for valid reasons (e.g., litigation). Any such request must identify the project (by project number, number of units reserved, and development method) and have a succinct statement as to why the project should not be terminated. The deadline date for a project under review for exceeding the TDC caps shall be automatically extended for the necessary review process time relating to the Headquarters determination pursuant to paragraphs 2 and 4 of this Notice.

e. If a PHA fails to meet its site approval and/or construction start deadline, the Field Office shall make the necessary determination that the PHA is in substantial breach or default under the ACC as the basis for termination of the ACC with respect to the project. The basis for declaration of a substantial breach will normally be that a PHA has failed to prosecute diligently or proceed with the timely development of a project or that the project cannot be completed within the maximum development cost approved by HUD as provided under Section 507(5) of the ACC. In such cases the Field Office shall prepare an amendment to the ACC as well as Form HUD-52540, Project Accounting Data, reducing the funds reserved for the project to an amount equal to the funds currently advanced to the PHA plus any outstanding and unpaid liabilities incurred by the PHA with respect to the project.

The reservation of funds should not, however, be reduced until after the ACC amendment has been fully executed. The PHA shall be notified in writing that it is in substantial breach/default and that the project is being terminated. The PHA shall be tendered the amended ACC which is to be returned to the Field Office after execution. In its letter to the PHA, the Field Office shall request the documents identified in paragraph 6-6c(3)(c) of Handbook 7417.1 and shall take the actions required by paragraphs 6-6c(3)(d) and (e) as necessary. In taking close out actions for the terminated project, Field Offices are authorized to transfer the remaining balance of the PHA's unliquidated debt to any other public housing project in development for which an Actual Development Cost Certificate has not been approved by the Field Office. Costs for items which can be legitimately used on the new project (if any) should be charged to the appropriate accounts on the budget. Any costs which were expended solely for the benefit of the cancelled project should be shown on a separate line on the budget entitled "Residual debt for project __________" and only these costs may exceed the maximum TDC caps. In the event that the PHA refuses to execute the ACC amendment within 30 days, the Field Office shall invoke the provisions of Section 502 of the ACC with respect to that project.

f. Within 30 days from the date of this Notice, Field Offices shall submit a memorandum which lists each project, by project number, which has not achieved HUD site approval as of the date of this Notice. The RMS Number for this report is MM112100-403s.

g. In accordance with the Fiscal Year 1983 Continuing Resolution, a maximum effort is expected of all Field Offices to meet these site approval and construction start commitments. Headquarters should be informed of any Handbook procedures which are hindering expeditious processing of particular projects.

6. SUBMISSION FOR REVIEW: All project review packages with accompanying recommendations shall be addressed to the Deputy Assistant Secretary for Public and Indian Housing. Packages relative to the TDC caps are to be directed to the attention of the Technical Support Division; packages relating to time limits policy are to be directed to the Public Housing Development Division.

Assistant Secretary for Housing-
Federal Housing Commissioner

REASONS FOR NOT STARTING BY SEPTEMBER 30, 1983

(PUBLIC HOUSING PROJECTS THAT FIELD OFFICES ARE NOT CANCELLING)

REGION	LOCAL RESISTANCE	SITE PROBLEM	FINANCING PROBLEM	LACK OF AMENDMENT DOLLARS	FIELD OFFICE STAFFING PROBLEM	COSTS	OTHER*	TOTAL
I		6 206			4 130		18 836	28 1172
II	7 485	15 1203				4 279	46 5736	72 7703
III	5 255	10 374	2 60		1 80	2 85	19 942	39 1796
IV	5 396	14 859		1 20		1 72	15 759	36 2106
V	4 163	8 465				4 144	22 1506	38 2278
VI	2 60	18 885			1 48	3 123	15 674	39 1790
VII		1 44			2 60		8 304	11 408
VIII		1 14					6 194	7 208
IX	23 618	5 361					32 963	60 1942
X		1 30					3 90	4 120
TOTAL	46 1977	79 4441	2 60	1 20	8 318	14 703	184 12004	334 19523
PERCENTAGE:	10	23	-	-	2	4	61	

NOTE: * Other includes projects reserved in Fiscal Year 1982, litigation, need to reformulate, awaiting Headquarters' action or waiver requests, etc.

PUBLIC HOUSING PIPELINE SURVEY

National Totals - Master Table

Region	Projects	Number of Units			Construction Start	
		Approved	In Process	To be recap	Before 9/30	After 9/30
I	74	4,424	3,748	(9) 676	(37) 2,576	(28) 1,172
II	163	16,096	15,521	(11) 575	(80) 7,818	(72) 7,703
III	162	7,711	6,771	(11) 940	(112) 4,975	(39) 1,796
IV	200	11,042	10,049	(19) 993	(145) 7,943	(36) 2,106
V	163	9,091	8,398	(8) 693	(117) 6,120	(38) 2,278
VI	133	5,720	5,638	(3) 82	(91) 3,848	(39) 1,790
VII	38	1,812	1,669	(2) 143	(25) 1,261	(11) 408
VIII	24	814	800	(1) 14	(16) 592	(7) 208
IX	275	7,200	6,732	(11) 468	(204) 4,790	(60) 1,942
X	19	637	637	0	(15) 517	(4) 120
Total	1,251	64,547	59,963	(75) 4,584	(842)40,440	(334)19,523

Number of Units for Small Families (2 bedrooms or less including units for the elderly) in the Preconstruction Pipeline not Scheduled for Cancellation

Region	Projects without budgets (Units)	Projects with budgets (Units)
I	1,560	1,354
II	7,822	5,073
III	3,220	2,125
IV	3,290	4,016
V	3,926	2,305
VI	2,108	1,915
VII	0	0
VIII	152	505
IX	2,303	2,900
X	117	383
TOTALS:	24,498	20,576

Number of Units for Large Families (3 or more bedrooms) in the Preconstruction Pipeline not Scheduled for Cancellation

Region	Projects without budgets (Units)	Projects with budgets (Units)
I	424	410
II	1,001	1,625
III	857	569
IV	1,336	1,407
V	1,602	565
VI	891	724
VII	825	844
VIII	12	131
IX	818	711
X	21	116
TOTAL	7,787	7,102

All Projects In The Preconstruction Pipeline Not Scheduled For Cancellation

Region	Budget authority (units) for projects without budgets		Budget authority (units) for projects with budgets	
	Budget Authority	(Units)	Budget Authority	(Units)
I	$310,046,000	1,984	$273,338,000	1,764
II	1,538,761,000	8,823	954,819,000	6,698
III	652,670,000	4,077	416,355,000	2,694
IV	575,906,000	4,626	636,552,000	5,423
V	977,180,000	5,523	417,833,000	2,870
VI	390,051,000	2,999	317,728,000	2,639
VII	114,396,000	825	115,972,000	844
VIII	24,205,000	164	74,581,000	636
IX	613,253,000	3,121	599,024,000	3,611
X	13,550,000	138	91,427,000	499
Total	5,210,018,000	32,285	3,897,629,000	27,678

(Public Housing Projects* That Field Offices Report Will Start After 9/30/83)

	Reservation Year						
Region	FY 77	FY 78	FY 79	FY 80	FY 81	FY 82	Total
I	5 209	3 184	1 62	0	8 416	11 301	28 1172
II	4 342	8 624	26 2774	8 1178	18 2280	8 505	72 7703
III	1 125	5 235	2 65	8 268	12 517	11 586	39 1796
IV	0	2 190	5 453	11 605	9 413	9 445	36 2106
V	3 125	6 777	6 185	4 242	6 506	13 443	38 2278
VI	1 21	4 180	7 422	10 492	7 372	10 303	39 1790
VII	0	0	0	1 50	6 222	4 136	11 408
VIII	0	0	0	1 30	1 14	5 164	7 208
IX	0	2 136	19 692	6 277	11 419	22 418	60 1942
X	0	0	0	0	1 8	3 112	4 120
Total	14 882	30 2326	66 4653	49 3142	79 5167	96 3413	334 19523
Percentage:	4	12	24	16	27	17	

*Top numbers are "projects," underneath are "units."

Regional Office	PROJECTS WITH BUDGETS				PROJECTS WITHOUT BUDGETS				PROJECTS DESIGNATED FOR CANCELLATION			
	Start by 9/30		Start After 9/30		Start by 9/30		Start After 9/30		With Budgets		Without Budgets	
	Units	Budget Authority	Units	Budget Authority	Units	Budget Authority	Units	Budget Authority	Units	Budget Authority	Units	Budget Authority
I	1,719	265,037	45	8,301	857	133,850	1,127	176,196	531	28,010	145	13,187
II	5,855	831,223	843	123,596	1,963	373,845	6,860	1,164,916	110	15,605	465	64,081
III	2,432	368,933	262	47,422	2,543	421,078	1,534	231,592	-	-	940	64,805
IV	5,174	601,462	249	35,090	2,769	357,952	1,857	217,954	150	1,725	843	87,136
V	2,820	412,173	50	5,660	3,300	503,105	2,228	474,075	-	-	693	65,969
VI	2,378	281,200	261	36,528	1,470	188,285	1,529	201,766	-	-	82	9,116
VII	666	100,139	178	15,833	595	83,919	230	30,477	71	19,687	72	19,822
VIII	592	69,325	44	5,256	-	-	164	24,205	-	-	14	2,395
IX	2,991	500,970	620	98,054	1,799	337,392	1,322	275,861	259	45,431	209	18,624
X	434	76,232	65	15,195	83	2,910	55	10,640	-	-	-	-
TOTAL	25,061	3,506,694	2,617	390,935	15,379	2,402,336	16,906	2,807,682	1,121	110,458	3,463	345,135

PUBLIC HOUSING PIPELINE RECAPTURES/DEOBLIGATIONS

Senator GARN. Based on your field survey, how many of the approximately 64,000 units in the pipeline are to be terminated and how much does this represent in deobligations?

Secretary PIERCE. I will let Phil answer that.

Mr. ABRAMS. The survey identified 4,584 units that were infeasible, and we have instructed the field to terminate the projects and recapture the funds for those units. That represents budget authority of $456 million.

Senator GARN. The survey also identifies 19,523 units that are experiencing local resistance, site problems, litigation, or other problems.

Do you have any estimate on what percent of these projects will not make it to construction?

Mr. ABRAMS. Well, there are 7,000 units that are either having problems with local opposition or site acquisition. We think that many of the PHA's developing these projects will accept the offer that we have tendered, to swap these for section 8 existing certificates or moderate rehab units. There are another 7,800 units that are delayed for miscellaneous reasons, such as litigation. We think that some of those also will be swapped.

At this stage, we have sent out those notices to the field and we have had a conference call with the housing directors to answer any of their questions. They are now going about transmitting the information to the housing authorities which we have given them—the recapture policy and the total development cap notice on a different track. We will be able to get the field people together soon, we hope, to find out exactly what is going to happen.

I think a great many of the 19,523 units that are sort of in limbo are not going to proceed to construction. But the feeling of the housing authorities is always more optimistic in reporting to us their projections than the evidence bears out after the fact.

PIPELINE PROJECTS WITH BUDGETS

Senator GARN. You have also reported that 42 percent of the projects in the pipeline that have budgets currently exceed the total development cost caps, TDC's. About 57 percent of the projects in the pipeline do not currently have a budget.

As I mentioned to you in my April 19 letter, I am concerned about how these projects will be treated. What are your plans on the projects? What do you intend to do with them?

Mr. ABRAMS. For projects that exceed the total development cost cap, we have established a headquarters review team of career HUD experts who will review the plans for their architectural design as well as the cost of their site.

Senator GARN. When do you expect that to start and how long do you think it will take?

Mr. ABRAMS. It is going to start as soon as we get the first submission. Everything is ready to begin. Unless we get an overload of cases referred to us, we should be able to handle them within a 2-week period from when we receive the information to when we are able to notify the housing authority and the field office whether or not we have any constructive suggestions.

We acknowledge that we have a commitment to either come up with constructive suggestions for bringing the costs down or granting the waiver. But we have adequate staff to make those reviews in a timely fashion, and we intend to do it so that we can comply with the statutory direction to make all feasible projects move to construction.

BASIS FOR DECIDING PROJECT CANCELLATION

Senator GARN. I would like to make it very clear at this point for the record that the TDC decision is going to be based on technical and cost data rather than on political pressure. That is the only basis it ought to be made on.

Do you have any estimate as to how many projects will not meet the 9-month site selection or 12-month construction deadlines specified in your field memo?

Mr. ABRAMS. Well, there are 57 percent of the projects in that pipeline that do not have a budget. Many of them don't have site approval. So we have given the projects that have not selected a site 9 months to obtain site approval. Then, after that point, once site approval is obtained, we have given them an additional 12 months to get the construction started after the approval of the site.

I really can't give you a finite answer in terms of how many projects will fall into either of those categories because the field offices don't get a real handle on the project until it comes in with a budget and an indication of whether or not there is a site approval.

Senator GARN. Can you keep us informed and give us a running average of what is going on?

Mr. ABRAMS. Yes, sir.

RATE OF UTILIZATION OF CIAP FUNDS

Senator GARN. To date we have provided $6 billion for the CIAP program. Although the objective of upgrading our public housing stock is certainly commendable, it is the implementation of the program that will ultimately determine its success and political support.

Last month we asked you to provide us with an update of the amounts appropriated, approved, advanced, and obligated to date. Let me read these numbers: $6 billion appropriated, $3.4 billion approved, $0.8 billion advanced, $0.5 billion obligated, $0.2 billion expended. So only 3 percent of the appropriated funds have been expended since fiscal year 1981.

These figures certainly support the contention that I have made in the committee and on the floor many, many times, that these are not jobs programs. I will stop. I won't get started on the latest jobs program.

DISTRIBUTION OF FISCAL YEAR 1983 CIAP FUNDS

On April 7 you sent me a letter outlining the steps you intend to undertake in this process for fiscal year 1983. Could you please describe what steps you are taking to accelerate the distribution of the fiscal year 1983 funds?

Secretary PIERCE. Phil will answer that because he has responsibility for that.

Mr. ABRAMS. What we have done is come up with an expedited procedure for fiscal 1983 that, hopefully, will cut down processing in place in the field. It is being acted upon by the field and will cut down the time period that it takes to get the money out.

As you have stated, in a program like this with discretionary grants, there is an application and review process that requires a field visit to the site. We have authorized the field to obligate the funds after the field review instead of going through the formal obligation process. To the extent that that will expedite matters, and with the cooperation of the general counsel, his staff in the field is going to try and expedite the next step, which is that once the grant is approved, to codify it in an amendment to the annual contribution contract.

The process is cumbersome and the backlog of 1982 and prior-year funds that is out in the field is a concern I know to you and to us. We have taken efforts to try and get the money that already is obligated and does have an ACC amendment in place to construction so that we can improve the living conditions for the tenants and increase the energy efficiency of the buildings.

One of the positive aspects of the proposal in this year's budget is to replace modernization with a replacement allowance would expedite this whole process by cutting down on the next application and grant and approval procedures that are in a discretionary grant program. Each housing authority would get a replacement allowance along with its operating subsidy and would not have to go through that process. But in the meantime, we are committed, because it has benefits for the tenants, for the management of the housing authorities, and for our budget concerns in terms of reducing operating expenses, to making the program work as effectively and as quickly as possible.

SLOW RATE OF USAGE FOR CIAP FUNDS

Senator GARN. I suppose there is one positive benefit from a jobs program. It is the surest indicator that the recession is over—every time we pass one. [Laughter.]

I notice that in some States, like Utah, the PHA's have expended most of their fiscal year 1981 funds, 86 percent, whereas other States, like Rhode Island, it is 6.7 percent; Michigan, 2.4 percent. It is a little difficult for me to understand. I hear so much about Michigan and their high unemployment rate, their need for jobs, and so on. Here they have only expended 2.4 percent of their funds. How do you account for such large differences?

Mr. ABRAMS. A lot of it has to do with the effectiveness of the housing authority. In Detroit I went out and met with the housing authority and our field people. They had a substantial backlog. We came up with ways that are in the works now to expedite the process.

One of the problems in large cities—well, in some of the large housing authorities—is that—and Detroit is a perfect example—the housing authority has had so many section 8 new units built in Detroit that many of the tenants from the public housing projects moved out into the section 8 new projects, and the housing authority would like the modernization program to provide sufficient funds so that they can make every public housing project better than the section 8 new construction projects so that the tenants will come back. And I say that not demeaning Detroit. With the best of intentions, the housing authority is trying to be of service and is trying to get tenants into their vacant units. But it is that type of problem with the modernization program that created some furor back in February when we tried to direct the housing authorities to use the modernization funds to bring units up to safe and decent housing standards but not to get involved with projects that involve unnecessary embellishments and compete with section 8 new construction. I don't think it is your intent, and I know none of us want people competing. We want to make the programs work effectively to help everybody and spread the money that we have around so that we can cure all the substandard conditions in public housing and the problems with energy efficiency.

Senator GARN. Would you supply for the record how you plan to accelerate the use of the funds that have been previously appropriated that I mentioned?

Mr. ABRAMS. Yes, sir.

[The information follows:]

EXPEDITING THE MODERNIZATION PIPELINE

In the last several months, the Department has taken a number of actions to expedite the modernization pipeline and insure high-quality processing of fiscal year 1983 applications. These actions support the Department's policy that the field office staffs give the CIAP their highest priority. These actions include:

(1) Greater use of PHA certification in contracting, where appropriate; (2) where prior HUD review and approval of contracting documents are necessary, there will be strict adherence to established timeframes; (3) PHA execution of architect/engineer contracts within 3 months of ACC amendments for fiscal year 1983 CIAP funds; (4) execution of ACC amendments for fiscal year 1983 CIAP funds within 45 days of final application approval; and (5) increased monitoring by HUD headquarters, regional offices, and field offices. Headquarter's teams have recently visited 11 field offices to review the modernization pipeline and to provide technical and policy assistance to both HUD field staff and PHA's. The following field offices were visited: Chicago, New Orleans, Newark, New York, Detroit, Baltimore, San Francisco, Los Angeles, Dallas, Philadelphia, and our office in the Caribbean. Further followup with these and other field offices is anticipated.

MEASURING SUCCESS OF CIAP PROGRAM

Senator GARN. At last year's hearing I asked you how you were determining the need for CIAP funding. You stated that the Perkins and Will study was used to assess the needs. That study identified several levels of rehabilitation—levels I, II and III—plus accessibility and energy conservation needs. In all, these amounted to $10.2 billion, of which $6.8 billion represented less pressing needs, such as making projects easier to maintain and more attractive. Using the data from that HUD-sponsored study, we could correct all safety, accessibility, and energy problems, and all violations of the minimum property standards for about $4.5 billion in fiscal year 1983 dollars.

To date we have appropriated $6 billion for the CIAP program, so theoretically we should be done.

Let me ask you last year's question again: How are we measuring the success of the CIAP program on a national basis and how much of the rehab needs have we addressed to date?

Mr. ABRAMS. The Perkins and Will report talks about actual loan authority, the amount of money that is actually spent. The $6 billion in budget authority equates to about $3 billion in loan authority, to put it on an apples and apples basis with the Perkins and Will estimate.

On that basis, we think that there is a need for somewhere between $6 and $7 billion in loan authority. And we have a little over $3 billion out in the field. That is why our budget authority request for fiscal years 1984 through 1988 totals $3.4 billion, which we believe would be able to take care of the emergency needs and the substandard units, particularly in those housing authorities that would be going through a transition and wouldn't have a replacement allowance to utilize.

In direct answer to your question, I think it took us a year to understand exactly how some of the modernization money was being used. Unfortunately, a lot of the money appropriated in 1981 was used, as I described the situation in Detroit, to do work that was far and above what Perkins and Will estimated. And I think Perkins and Will overestimated the real need for modernization, in bringing units up to standard, housing quality, and curing energy inefficiency.

So with the redirection that we have worked out with your staff and the House staff and the prioritization that we have given to the housing authorities, we are now in a position where our field offices are reviewing proposals very carefully and the utilization of money that was appropriated in 1982, and particularly in 1983, to make sure that that money is prioritized so that we can reduce the demand by housing authorities to cure vacancies, substandard units, and energy inefficiency before we get involved with projects that use up a great deal of funds in trying to recreate the projects in the section 8 new construction image.

PUBLIC HOUSING—CIAP STUDY

Senator GARN. As you know, the House authorization committee earmarked funding in your policy research and development account for an extensive update of the Perkins and Will study and a review of our accomplishments to date. I think that this study is a wise use of funds for two reasons: First, we must develop some measures of need in order to limit the Federal exposure on the CIAP program; and second, we need to establish goals and objectives in order to measure the program's success and determine the appropriate levels of funding.

I would appreciate it if you would continue to work with the subcommittee staff so that we can define the scope of the study.

Secretary PIERCE. Yes, we will continue to do that.

PUBLIC HOUSING OPERATING SUBSIDY

Senator GARN. You are requesting $1.636 billion for public housing operating subsidies in fiscal year 1984. As you know, the House subcommittee recommended $1.43 billion.

I would like to take a moment to walk through the subsidy calculations.

Let's start with the estimated PFS base of $1,409,700,000. Now, we have a $69 million proposed rescission in fiscal year 1983 that can be released to offset the fiscal year 1984 requirements. This leaves us with a $1,340,700,000 unfunded requirement.

Now, let's add some things back in.

How much did you anticipate saving if food stamps were included as income?

Secretary PIERCE. We estimated $126 million would be saved in fiscal year 1984.

Senator GARN. How much did you anticipate as a result of raising the permissible rent increases from 10 percent to 20 percent?

Secretary PIERCE. An additional savings of $8 million is estimated from increasing the rent increase cap to 20 percent from 10 percent.

Senator GARN. So that puts us back at $1,474,000,000. Would you like to make any further adjustments in terms of your inflation or fuel cost estimates?

Secretary PIERCE. Yes, there is an estimated savings in fiscal year 1984 of $32.5 million from the impact of a 13-percent decrease in fiscal year 1983 oil prices.

Senator GARN. That leaves us with a requirement of $1,442,200,000.

I understand that the fiscal year 1983 PFS may be even lower than expected. These funds could also be made available for use in fiscal year 1984 if we waive section 9(d.] as we did in the fiscal year 1983 Act.

What is your most current estimate of the additional amount that might be available for use in fiscal year 1984?

Secretary PIERCE. I think it is $80.5 million.

Senator GARN. Is that in addition to the $69 million in the rescission?

Secretary PIERCE. Yes.

PROPOSED 1983 DEFERRAL OF UDAG FUNDS

Senator GARN. On what basis did the administration propose a fiscal year 1983 deferral of UDAG funds?

Secretary PIERCE. I will let Mr. Kliman answer that because we have gone through that a number of times.

Mr. KLIMAN. Mr. Chairman, the administration proposed the deferral on the basis of having a $244 million unobligated and unannounced balance as of September 30, 1982. The deferral was proposed in order to have a constant program level over fiscal years 1983 and 1984.

Senator GARN. Did the Department recommend this deferral to OMB?

Mr. KLIMAN. No, we did not, sir.

DEMAND FOR UDAG PROGRAM

Senator GARN. Is the large carryover of funds from 1982 into 1983—$244 million unannounced/unobligated—indicative of a lack of demand for the UDAG program? Do you have sufficient applications?

Secretary PIERCE. Mr. Bollinger will handle that question.

Mr. BOLLINGER. Mr. Chairman, in looking at the last couple years' history, we find that we have more than adequate demand for the UDAG program. In 1982, for example, there had been a lot of attention given to small cities. We had 361 small cities submit applications. We funded 133 of those. That has been increasing.

The Secretary just recently announced the largest small cities round in the history of the program with 76 grants. This comes close to matching the largest dollar round as well. With three-quarters of small city funding completed, we have already reached the 25-percent set-aside amount for small cities. We have already announced grants in this fiscal year totaling $112.5 million. With two more large city rounds yet to be announced, we have already announced over $264.4 million.

We think that our outreach efforts, such as the training of our own staff, as well as the staff that has been trained on a State and local level, et cetera, has provided sufficient applications to justify the funds that we have requested.

LACK OF SMALL CITIES PARTICIPATION IN UDAG

Senator GARN. A large amount of the small cities funds were carried over from fiscal year 1982 to fiscal year 1983. A recent GAO report noted several impediments to small city participation in the UDAG program. Senator Stennis is also very interested in assuring that we are doing all we can to encourage small cities to participate.

Why do you believe that there has been so little participation by small cities in the urban development action grant program?

Mr. BOLLINGER. I think basically, Mr. Chairman, that the program is relatively new. Initially, a great deal of attention was placed on larger communities. However, there has been increased activity, especially under Secretary Pierce's leadership, with regard to outreach to small cities. The most significant part of the Nation's economic recovery has been a reduction of interest rates. With the training and familiarization that has taken place in the last couple of years about the program for small cities and the lowering of interest rates, we are now overcoming what has been perceived as being a problem. We don't think it is at this point. With the outreach that is being done and the lower interest rates, et cetera, I think we can accommodate any Member of the Congress concern about small city participation.

Secretary PIERCE. Mr. Chairman, I would just like to add a word here about that. There is no doubt about it, I think that our economy has had something to do with this because businesses have been hesitant to make moves. This has affected small cities in particular. But also we have been giving a great deal of technical training, as Mr. Bollinger indicated, to the smaller cities. I think that has helped. And just recently, in April, when we had our April round, we broke all kinds of records with the amount of money that we gave smaller cities and the number of applications that we had. So I foresee the smaller cities doing much more participating, much more in this program than they have in the immediate past.

INCREASING SMALL CITIES PARTICIPATION IN UDAG

Senator GARN. Do you have any activities planned to publicize the program more to small cities? Because it seems like part of the problem has been just a general lack of awareness.

Secretary PIERCE. Yes, sir, we are working very much on that.

Mr. BOLLINGER. We have a variety of things taking place, Mr. Chairman. We have national contracts through the Secretary's technical assistance program with organizations like the National Development Council, Haleyon, and the National Association of State Development Agencies. Our field offices have just done a mailer to all small cities that are eligible for the program on a revised UDAG brochure that explains the program and gives them the information they need to make applications for the program.

The Secretary will be extending this outreach on all fronts. Increased technical assistance to our own staff so they can better advise small cities, as well as increased direct technical assistance to States in the adoption of the community development block grants program and the successful implementation of this program in 36 States, have been a tremendous resource in accessing the UDAG program for small cities. So that is why I think the Secretary and all of us are extremely optimistic about their increased awareness and participation in the future.

Senator GARN. Mr. Secretary, I would like to associate myself with the remarks that you made on May 4 when you announced 76 UDAG grants to small cities. That is, and I quote:

> There is no better way for distressed communities to help themselves than by developing a partnership with the private sector. That means growth of permanent, private sector jobs in the places that need growth most.

So if there is anything that I can do to help you encourage the partnership with small cities, I certainly would like to do that.

HOUSING COUNSELING ASSISTANCE REPORT

Secretary PIERCE. Thank you very much.

Senator GARN. In our fiscal year 1983 Senate report we asked you to do a study on the effectiveness of HUD-funded housing counseling assistance programs. Last month we received that study.

What did you conclude about the level of funding the program has received through the CD program versus through direct appropriations?

Secretary PIERCE. Phil will answer that.

Mr. ABRAMS. The report didn't address itself to the level of funding. It addressed itself to the effectiveness of housing counseling funds, regardless of the appropriation levels.

The conclusion of the report was that housing counseling grants are not cost-effective in terms of their benefits to the FHA fund or any Federal cost burden.

Senator GARN. As I read your study, it concludes that the effectiveness of the counseling program is difficult to assess and that the benefits, if any, may be short lived. You also conclude that there appears to be a useful role for HUD in certifying counseling agencies and training housing counselors in home ownership counseling.

How much do you intend to spend on certification and training during fiscal year 1984?

Mr. ABRAMS. We don't have a discreet request for funding for that. That certification and training is done by the housing field staff throughout the area offices in the country.

TYPE OF COUNSELING PROGRAM IN 1984

Senator GARN. As you know, the House subcommittee recommended $5 million for this program in their markup last week. If this money were made available, what type of counseling-related activities—training, certification, evaluation—would you recommend it be used for?

Mr. ABRAMS. If we are going to have housing counseling grants, I think the most beneficial use would be to do default counseling rather than what is now mandated as comprehensive counseling, and that has had some benefit. Although we can't justify it on a cost-effective basis, it does have some benefits in terms of supplementing the community development block grant funds that are used for counseling and helping families meet their obligations for mortgages or paying rent.

HOUSING ASSISTANCE COUNCIL

Senator GARN. What funding is envisioned for the Housing Assistance Council in fiscal year 1984?

Secretary PIERCE. Mr. Bobo?

Senator GARN. Any volunteers? [Laughter.]

Mr. BOBO. Mr. Chairman, as in the past, we have not included a figure in our budget proposal for that. But we would accommodate or we can make some attempt to accommodate the committee's recommendation. [Laughter.]

AMERICAN (ANNUAL) HOUSING SURVEY

Senator GARN. What funding is being provided for the American—annual—housing survey?

Secretary PIERCE. Mr. Bobo?

Mr. BOBO. We are recommending that we allocate $9 million for the annual housing survey.

REDUCTION IN RESEARCH FUNDING

Senator GARN. The House subcommittee only recommended $15 million for your research and technology account during fiscal year 1984. What activities would not be undertaken at this level of funding?

Secretary PIERCE. Mr. Bobo, express yourself. [Laughter.]

Mr. BOBO. The $15 million, Mr. Chairman, we think is a low figure for us. When we look at what is being asked for HAC, when we consider a couple of other proposals that the authorization committee has included, we find that it is going to be very difficult for us to accommodate the studies that have been included in the authorization committee's request at the $15 million level. When you add all of the items, including the $9 million that we intend to put into the annual housing survey, it would not permit us any discretionary ability in carrying out the research programs that we have proposed and submitted. So it is very difficult for us to operate at the $15 million level.

Secretary PIERCE. I would like to emphasize that, Mr. Chairman. It seems in recent years there has been a movement to cut down our research funds. The way we look at it, we need at least $20 million to do the things we are required to do and to have a little leeway. We need a little leeway because during the year a number of things come up that require us to do research for housing or for community development or other things. We are also working on an urban policy report again. It is going to be a very important one for this year.

So I urge you, Mr. Chairman, if at all possible, try to keep that level of funding at $20 million or more.

Senator GARN. Before closing the hearing, Mr. Secretary, I would like to thank you personally for your cooperation during the past year, and particularly thank Mr. Kliman and Mr. Van Lowe for the very, very professional assistance they provided the subcommittee since the hearing last May.

QUESTIONS SUBMITTED FOR THE RECORD

Because you were so kind to not read all 35 pages of your statement, I will not ask 41 pages of additional questions. [Laughter.] But I will submit them to you for your response in writing.

[The following questions were not asked at the hearing but were submitted for response for the record:]

QUESTIONS SUBMITTED BY SENATOR GARN

FHA INSURANCE PROGRAMS

In its Fiscal Year 1984 Budget transmittal to the Congress, the Administration proposes a wide range of initiatives designed to target FHA insurance programs to those who are unserved or underserved by the private market and to bring existing programs in line with changing mortgage financing conditions. These proposals include the following:

-- Elimination of the Secretary's authority to set interest rate ceilings for insured loans. Interest rates, instead, would be negotiated between the borrower and the lender.

-- Change in maximum loan-to-value ratios for single-family houses. Proposed changes would reduce downpayment requirements for purchasers of modestly-priced single-family homes.

-- Authority to provide insurance for new financing mechanisms including Adjustable Rate Mortgages (ARMs), Shared Appreciation Mortgages (SAMs), and, on a limited demonstration basis, Reverse Annuity Mortgages (RAMs). In addition, the Administration would eliminate certain restrictive features of the Graduated Payment Mortgage (GPM) program and extend this program to multifamily projects.

Question: What are the benefits that would result from the adoption of each of these proposals?

Answer: The benefits expected to be derived from the adoption of the legislative proposals are as follows:

-- Negotiated Interest Rates

Eliminates unwieldy system of "points" needed to offset low FHA rates:

* substantial differences in rates can cause a tremendous decline in FHA activity; and

* points are paid by buyer through higher purchase price.

-- Change in Loan-to-Value Ratios

* Increases affordability by substantially reducing the downpayment requirement for buyers of modestly-priced homes. Under this proposal, properties appraised at $50,000 and below will require a downpayment of 3 percent. Properties appraised for higher than $50,000, must meet a 10 percent downpayment requirement for amounts in excess of $50,000.

-- Adjustable Rate Mortgage (ARMs)

* Expands the supply of mortgage funds so as to provide lenders and investors with a hedge against increases in interest rates.

- * This hedge would provide the lender with some flexibility to adjust rates to market conditions and at the same time provide the prospective homebuyer with a lower contract rate initially, making home purchases more affordable.

— Shared Appreciation Mortgages (SAMs)

- * Makes possible a substantial reduction in the downpayment and in monthly mortgages payments in exchange for the lender receiving a share of any appreciation of the property. The lower monthly payments may be fixed or graduated, depending on the preference of the homebuyer.

— Home Equity Conversion Mortgages (including Reverse Annuity Mortgages--RAMs)

- * Permit elderly homeowners who own mortgage-free homes to convert the equity in their homes into needed cash, to meet major home-related (e.g., increasing utility costs, property taxes) expenses, thus, permitting the elderly homeowners to remain in their homes.

— Revisions to Section 245 (Graduated Payment Mortgages--GPMs)

- * Single Family

  Eliminates the "non-ownership" (limits program to mortgagor who has not owned homes within the preceding three years) and "affordability (mortgagor must not be able to afford to finance purchase under any other insurance program) eligibility requirments. The effects will be to increase home purchases for many more qualified home buyers.

- * Multifamily

  Allow GPM's for multifamily insured projects. Similar to the single-family GPM, this GPM for multifamily programs will provide for significant reductions in early year monthly payments, offset over the duration of the mortgage by reasonable increases in rents.

TENANT RENT CONTRIBUTIONS AND OPERATING SUBSIDIES

Question: In calculating your request for operating subsidy estimates for FY 84, you included the value of food stamps in determining tenant income; proposed raising the limit on annual rent increases from 10 to 20 percent; and assumed the maximum allowable rent contributions to 28 percent of income for existing public housing tenants to reflect the third year increment of increasing the rent to income ratio to 30 percent of income.

Both the food stamp and the 10-20 percent rent increase proposal require legislative changes.

How much would need to be added to your operating subsidy request of $1.636 billion if these proposed changes were not enacted?

Answer: Regardless of the system used to determine operating subsidy requirements--a market-based or performance funding system approach--not enacting the Department's proposal to include Food Stamps in determining tenant income would add $126 million to the budget authority required in 1984 under the Operating Subsidy program. A 10 percent rent increase cap in lieu of the 20 percent cap proposed would add another $8 million to 1984 requirements for Operating Subsidies. By not going to 28 percent for existing tenants and 30 percent of income for new tenants, $11 million would be added to 1984 needs.

Question: Did you assume that the rent contributions of 28 percent of income would be implemented in October 1983 for everyone?

Answer: No, the rent to income ratio will be increased from 27 percent to 28 percent upon recertification of existing tenants during FY 1984. New tenants will pay 30 percent of income.

Question: What would the cost implications be if it was implemented in the third quarter of FY 84?

Answer: The six month delay will cause operating subsidies requirements to increase by about $5 million in FY 1984 if existing tenants continued to pay 27 percent of income as rent based on FY 1983 recertifications rather than 28 percent based on FY 1984 recertifications beginning October 1, 1983.

Question: What is the cumulative amount of delinquent Public Housing rent as of the end of Fiscal Year 1982?

Answer: The Department does not collect data on the cumulative amount of delinquent rents on a nationwide basis. Information relative to rent collections is reported to the Department's Field Offices for specific Public Housing Agencies but the data are not gathered nationally. A survey conducted in 1982, involving a sample of 26 large Public Housing Agencies which were responsible for approximately 50 percent of the Public Housing inventory, indicated that 17.6 percent of the units surveyed had more than one month rent delinquent during the year. It should be noted that the Performance Funding System used to develop Operating Subsidy requirements for PHAs makes no allowance for uncollected rents. Therefore, there is a strong incentive for PHAs to make every effort to minimize rent delinquencies.

Depending upon the seriousness and nature of the problem identified, the Department can either pursue informal sanctions such as letters of warning to Boards of Commissioners or other responsible local officials or more formal sanctions such as refusing to approve PHAs' Operating Budgets.

Question: What is HUD's policy with respect to providing assistance to PHAs that have a history of poor rent collections?

Answer: The problem is addressed in detail for about 30 large PHAs which are in "trouble" and are under Headquarters directed workout plans. HUD's Field Offices monitor all PHAs based on information gathered in quarterly reports submitted to the offices relating to accounts receivable.

Senator Garn—Continued

Question: What impact does HUD believe will result from strengthening lease and grievance regulations to make it easier for PHAs to collect delinquent rents and to evict disruptive tenants? .

Answer: The Department has issued proposed regulations on the subject and has received over 800 comments. HUD is currently evaluating the comments received on the regulations which were published on December 13, 1982. When the final regulations are implemented, it is expected that the proposed regulations would streamline lease and grievance procedures and, therefore, disruptive tenants will be evicted more quickly and rent delinquencies will be reduced.

Question: What current information is available to HUD to show whether PHAs are carrying out rent establishment activities appropriately?

Answer: Income is now recertified for all tenants annually based on regulations effective on April 1, 1983. Field Offices conduct biennual occupancy audits for PHAs to make sure that PHAs are correctly establishing rents. A telephone survey indicated that about 98 percent of Public Housing PHAs with over 500 units have implemented the 1981 Act's provisions on revised rents and deductions.

Question: Does HUD have any data to show the extent of lost revenues because of poor PHA rent establishment practices?

Answer: No current data is available on lost revenues resulting from poor PHA rent establishment practices. However, Field Offices report that almost all PHAs have implemented new rules generated by enactment of the Housing and Community Development Act of 1981. The interim rule implementing the rent increase provisions in the 1981 Act was effective August 1, 1982, and as noted earlier, a telephone survey indicated that 98 percent of the larger PHAs had implemented the regulation. Rent establishment practices are reviewed biannually for each PHA by Field Offices. A major 1981 HUD study on implementation of rent rules found that substantial error rates occur in setting individual rents. Defining an error as an overcharge or undercharge of more than $25 month, the study revealed a 57 percent error rate in Section 8 New Construction, 22 percent in Section 8 Existing and 16 percent in Public Housing. The estimated net cost in 1981 was $40 million in the Section 8 program and $14 million in Public Housing.

Question: How much became delinquent during Fiscal Year 1982?

Answer: Although delinquency data are submitted to HUD Field Offices by the PHAs, the information is not tabulated on a nationwide basis. Therefore, it is not known how much in rental payments became delinquent in 1982.

Question: How does HUD monitor PHA rent collections?

Answer: HUD monitoring of PHA rent collections is accomplished by Field Offices through rent collection reporting (Tenant Accounts Receivable) and through on-going monitoring of PHA operations.

Rent Collection Reporting. PHAs submit a Report of Tenant Accounts Receivable (Form HUD-52295) to the Field Offices on a quarterly basis. The report indicates collection loss and the percentage of accounts delinquent. If there is a serious rent collection problem, the Field Office can require more frequent reporting in order to follow the situation more closely.

Field Office Monitoring. Based on the information acquired through the Tenant Accounts Receivable report, Field Offices are instructed to evaluate trends over a specified period of time. Among the parameters charted are: the amount of tenant rents receivable, rental income, percentage of accounts delinquent, and the percentage of dwelling rental charged-off as collection losses. Especially important is a comparison of trends among PHAs of similar size and operating circumstances.

Furthermore, rent collections are a point of examination for PHAs with serious problems during Field Office Management Reviews as well as during the biennial fiscal audits by Independent Public Accountants. The focus of these on-site reviews includes:

— Compliance with statutory and regulatory requirements on rent collections and evictions for nonpayment of rent;

— Amounts owed by tenants in possession and vacated units;

— Ratio of collection losses to annual dwelling unit rent incomes;

— Write-off procedures;

— Adequacy of security deposits in relation to fix up costs and turnover; and

— Effectiveness of utility surcharges and maintenance charges.

Additionally, for those PHAs operating with serious financial problems (designated as "financially troubled") the Department, in Headquarters and the field, work continuously with the PHAs at alleviating the problems causing the financial distress. This is accomplished through the development and enforcement of Financial Workout Plans and constant scrutiny and evaluation of PHA rental collection practices.

Complexity of the rent rules and lack of employee training were indicated as the main source of errors. Given that many PHAs experience high employee turnover, simplifying the rent rules would appear to be the best approach to improving this situation. This was the major reason why HUD proposed to simplify the rent rules in 1981, and we continue to believe that this is a critical administrative issue. Errors in rent charges penalize tenants as well as reduce revenues, and the question of simplified rent rules should be considered as a separate issue from the question of the size of deductions that should be provided for tenants.

Senator Garn—Continued

HOUSING PAYMENT CERTIFICATE PROGRAM

Question: HUD argues that the main problem facing the poor is affordability, not availability, of housing. Since there is no shortage, families can be helped by demand-side subsidies of about $1,900 to $2,000 a year compared with unit costs of $6,000 to $7,000 a year for newly built housing. Critics say that there are specific shortages of housing in many places -- for large families, the physically handicapped and the elderly, among others. Moreover, there is dispute over the quality of lower-priced rental housing in many areas. Opponents of this proposal say that some assisted families would have to settle for substandard units. What data do you have that lead you to conclude that there is sufficient rental units in standard condition available in most communities at the 40th percentile of rents or lower?

Answer: Data in the Annual Housing Survey indicate that the nation's rental stock is in basically sound condition. HUD and the President's Commission on Housing have concluded that the primary problem facing very low income renters is housing cost, not the condition of housing. The fact that there is a successful Section 8 Existing Housing Program with over 700,000 units operating in communities throughout the country shows that standard rental housing for lower income persons is available. Although the proposed payment standard is about 15 percent lower than the Fair Market Rent (FMR) used in the Existing Housing Program, it is still high enough to capture 40 percent of standard rental housing in each market area. The annual turnover in the rental market is typically in the range of 35 to 40 percent, which means that an adequate supply of standard rental housing will be available in most areas. For those areas where a sufficient supply of standard units may not be available, the Department is proposing a Rental Rehabilitation program.

Question: Would a certificate program result in government subsidizing of substandard units?

Answer: No, this result will not occur under our proposal because the housing unit selected by a participant in the Housing Payment Certificate program must pass a housing quality inspection in order to be eligible. The unit must also pass an annual reinspection, at which time defects are normally found and corrected. One of the primary objectives of the certificate program is to encourage better maintenance of modest quality rental housing.

Question: Are there specific shortages of housing for large families and for the physically handicapped and elderly?

Answer: There are no shortages of housing for the elderly, although there are special needs among the elderly and among handicapped individuals, that are not fully addressed by the private market. To meet these needs, we are proposing to continue the Section 202 program. The Section 8 Existing Housing Program has been very successful in addressing the housing needs of elderly and handicapped individuals. Under the Section 8 Existing Housing Program, large families have sometimes had difficulty in finding housing. HUD is considering policies that would make more units available for large families to address such problems, such as higher subsidy payments as an incentive for owners to participate in the program.

Question: As I recall, very little desegregation or family dispersion into middle income and affluent neighborhoods occurred under a predecessor program, the Experimental Housing Allowance Program. Would you expect the same pattern under this certificate program?

Answer: The Experimental Housing Allowance Program (EHAP) and also research on the Section 8 Existing Housing Program have shown that opportunities to move do exist under a certificate type of program. In the Section 8 Existing Housing Program, a 1979 study found that 89 percent of those who wanted to move did so. This same study found evidence of significant neighborhood deconcentration for minority households that moved. On average, black households moved from neighborhoods that were 52 percent minority-occupied to neighborhoods with 40 percent minority residents. There is no evidence that the Housing Payment Certificate program will not meet with the same degree of success, or better, than the Section 8 Existing program.

Question: Will the administrative fees for PHAs be adjusted to cover their new responsibilities under this program?

Answer: We expect the workload for PHAs to be lower under the proposed program than it is under the current Existing Housing Program--and have reduced the PHA fee accordingly. We estimate that fees under the current program will average around $300 per unit, versus a projected $250 per unit under the Housing Payment Certificate program.

Under the new program, PHAs will not have to review the proposed rent set for each unit to determine comparability, they will not be involved in rent negotiations, and will not have to process exception rents (i.e., rents that can be higher than the FMR ceiling under certain circumstances).

The Department will review the fee structure periodically to determine its adequacy and may propose regulatory changes to adjust the fees paid if we find that PHAs are unable to cover their reasonable costs under the structure as now proposed.

Question: Will the competitive rents charged for units rehabilitated under the new Rental Rehabilitation Block Grant Program be affordable by certificate holders?

Answer: Yes, at least 80 percent of the units to be rehabilitated must be available at rents which are within the payment standard for the area. This is the performance standard which is to be met by each city, urban county, and State in order for them to receive their full allocation in subsequent years.

Question: What are your estimates of the long-term costs of new subsidized construction compared to a voucher subsidy?

Answer: The budget authority required for subsidized new construction programs on a percentage basis is approximately three times that required for vouchers. For example, there are 10,000 units of Section 8 new construction/substantial rehabilitation proposed in 1984 under Section 202. These units involve an estimated

$68.8 million of contract authority and $1,376 million of budget authority. Under the Housing Payment Certificate program, 10,000 units would cost $19.2 million of contract authority and only $95.8 million of budget authority. This does not take into account any indirect subsidy costs due to losses of Federal tax revenue that occur under subsidized new construction programs, particularly those that involve tax-exempt financing.

Question: What plans has the Department made for evaluating the performance of the new certificates program?

Answer: The Department plans to conduct ongoing monitoring of the new certificate program. There has been a redesign of the system for monitoring Section 8 Existing Housing as well as Public Housing and the other assisted housing programs and this will apply also to the certificate program. Our monitoring activities should yield information on such subjects as participants, rent levels and results of reinspections. After several years it will be possible to conduct a study of the new program, comparing results with those obtained in Section 8 Existing Housing research.

TRAVEL BUDGET

Question: Please submit for the record a comparison of your FY 1983 and FY 1984 travel budget for both the field and headquarters offices. Also include a breakdown of the major HUD programs.

Answer: The funding level established for the field in the budget request is formulated on the basis of national requirements for each budget activity rather than on the basis of individual programs or geographical location. The distribution of funds among the Regions is made during the execution phase and is based upon total requirements for all activities. The following table indicated the distribution of FY 1983 funds and our estimate of how the level of funds proposed for FY 1984 will be distributed.

Senator Garn—Continued

HUD Travel by Budget Activity

	Estimate FY 1983	Estimate FY 1984
	(Dollars in Thousands)	
Housing Program	$6,436	$6,133
Government National Mortgage Association	31	31
Solar Energy and Energy Conservation Bank	20	0
Community Planning and Development	1,307	1,261
New Community Development Corporation	30	0
Policy Development and Research	125	108
Fair Housing and Equal Opportunity	909	885
Departmental Management	400	400
Office of General Counsel	162	160
Field Legal Services	109	106
Office of Inspector General	1,550	1,550
Administration and Staff Services	300	275
Training Travel	1,400	1,300
Field Direction and Operational Support	807	785
Field Administration	514	506
Total	14,100	13,500
Recapitulation		
Headquarters Travel	5,350	N/A
Regional Travel	8,750	N/A
Total	14,100	13,500

COSTS OF MODIFIED CERTIFICATES

Question: For Section 8 Existing, we are estimating an annual cost per unit of $4,000, while the modified certificate is expected to cost $1,916 a year to add a unit to the inventory. When we add back to the certificate program the cost savings achieved by: going from the 50th percentile to the 40th percentile; counting food stamps and lifting the rent increase cap from 10% to 20%, what is the revised cost of the certificate program?

Answer: If the impact of (1) including Food Stamps in determining tenant incomes, (2) a 20 percent cap on tenant rent increases and (3) utilizing the 40th percentile of all standard unit rents in establishing payment standards is eliminated from the computation of per unit subsidies under the Housing Payment Certificate program, the average reservation amount would be increased from $1,916 per unit to $2,584 per unit. The table below depicts the relative impacts of the various assumptions on the reservation amount:

Senator Garn—Continued

Housing Payment Certificate (1984 Budget)	$1,916
Legislative changes: Food Stamps and 20 percent cap on rent increases	+118
Increasing the Fair Market Rent/Payment Standards base from the 40th percentile of all standard units to the 50th percentile of recent movers	+550
Revised reservation amount	2,584

Question: Then is the remaining $1,416 basically associated with an increased tenant contribution?

Answer: No, the $1,416 -- which represents the difference between an estimated reservation amount under Section 8 Existing of $4,000 and an assumed reservation amount under the Housing Payment Certificate program of $2,584 -- does not represent increased tenant contributions. All things being equal (such as, tenant income and eligible deductions) the tenant's payment would be the same under either program: the greater of 30 percent of adjusted net income, 10 percent of gross income or the "welfare rent." However, the tenant's rent contribution could be greater under the HPC program if he or she chooses to rent a unit which is above the Payment Standard established for the local housing market.

Question: How do you respond to the issue that the Modified Certificate program is likely to evolve into an entitlement program?

Answer: The program is no more likely to become an entitlement program than Section 8 Existing Housing, which has been successfully operated as a discretionary program since Fiscal Year 1975.

HOUSING FOR LARGE FAMILIES

Question: Both the House and Senate Appropriations Committees have been somewhat concerned about the tendency to use public housing construction funding for elderly and small family units and the trend to use modernization funds for the conversion of multi-bedroom units to efficiency and one bedroom apartments. Are you concerned with this trend?

Answer: The Department is concerned about the adequacy of supply of all types of units, including those suitable for large families. A substantial number of large families already are being subsidized under the Section 8 Existing program. A certificate program has the advantage that large families are not concentrated in projects with other large families -- leading to social problems inherent in such concentrations. The Experimental Housing Allowance program evaluation suggested that large families may have trouble finding adequate housing in areas where a large portion of the rental housing stock is in poor condition. That is why the Department has proposed a Rental Rehabilitation program which will increase the supply of standard quality rental housing in such areas.

Question: Would you recommend placing restrictions on public housing, modernization or the use of Section 8 existing funds to encourage the inclusion of large family units in the inventory?

Answer: In the modernization program, our recent Notice to the Field provided a preference for projects to modernize large units where other factors are equal. When projects can be made feasible from a social and economic standpoint and continue to serve large families, that option is preferred to the kind of conversion you have mentioned. However, there are cases where it is not possible to assure a project's feasibility without a reduction in the number of children. We are also looking at ways to make Section 8 Existing more responsive to the needs of large families; currently, we are considering increasing the Fair Market Rents for units with three or more bedrooms. Basically, this would mean allowing larger intervals between FMR amounts as the number of bedrooms increases. Higher rents for larger units would also increase the incentive for owners of such units to participate in the program -- thereby increasing the supply of large units available to large low-income families.

Question: Will the 2 or 1-1/2 for one swap of public housing new construction for Existing Section 8 units or Mod Rehab have any effect on this situation?

Answer: Although final decisions have not been made, we are reviewing the possibility of taking unit sizes into consideration in approving the transfer of public housing construction funds to Section 8 Existing or Moderate Rehabilitation.

HOUSING FOR THE ELDERLY

Question: What was your original request to OMB for Section 202?

Answer: HUD proposed the approval of an additional 10,000 units during FY 1984--the same level that is now being requested.

Question: Do you believe that the 10,000 unit level is a reasonable annual target for FY 1984 and the outyears?

Answer: The Department is committed to meeting the housing needs of the elderly. The Section 202 program is only one of several programs which meet this need. The Section 8 existing housing program has been generally successful in meeting the needs of the elderly, and our proposed Housing Payment Certificate program is also expected to provide assistance for elderly households who typically face the same problem faced by most low-income households: decent housing is available but costs more than they can afford to pay. Providing subsidies for existing housing serves their need at much less cost--and gives the household the ability to choose whether to stay in their current housing unit or move.

The use of new construction under Section 202--as well as the proposal to permit CDBG funds to be used for housing construction--will assist communities where there is genuine housing shortage. As part of an overall housing assistance program, the proposed level for Section 202 funding is fully supportable.

Senator Garn—Continued

CHANGES TO THE PERFORMANCE FUNDING SYSTEM

Question: What are the basic differences between the Performance Funding System (PFS) that has been used since April 1975 and the proposed Fair Market Rent System (FMR)?

Answer: The changes HUD is proposing (i.e., the FMR-based system) relate to how operating and modernization subsidies are calculated. The new system will be simpler, and has two main features:

-- The Federal subsidy for public housing will be based on "Fair Market Rents," the private market rents used by HUD in providing housing assistance under the Section 8 Existing Housing program. This will provide an objective standard against which the costs of Public Housing can be measured by HUD, the Congress, the tenants, and Public Housing Agencies (PHAs) themselves.

-- The separate modernization program will be replaced by a replacement allowance, which will be part of the FMR-based subsidy paid directly to PHAs and can be used interchangeably with operating funds. Because these funds will be under the PHA's sole control, and not subject to shifting Federal priorities, PHAs will be able to plan for the most effective use of the funds. For a transition period, the separate modernization program would be maintained, in order to bring existing public housing projects up to standard before PHAs become totally dependent on the replacement allowance for repair and replacement needs.

Question: What impact does the proposed change to revise the system for determining PHA operating subsidies have on the overall funds provided for that purpose and PHA modernization?

Answer: The level of "catch-up" modernization determined necessary would be the same under the PFS or the FMR-based system. The basic differences in the two systems relate to how operating subsidies are calculated and how future modernization would be funded.

Most PHAs, about 91 percent, covering about 68 percent of all units, would, from the outset, receive as much operating funding as they would have in 1984 under the old system, plus a guaranteed replacement allowance. The remaining 9 percent, with about 32 percent of the units, would receive between 95 and 100 percent of the amount they would have received under the old system in 1984, plus the replacement allowance. After 1984, funding levels would drop by an additional five percent for a few PHAs until they reach levels equivalent to operating costs covered by market rents.

In addition, PHAs which receive less funding under this system would receive increased modernization funding during a transition period. This funding would enable these PHAs to reduce their utility and maintenance costs.

Question: Does the FMR-based system adversely affect any particular region of the country--for example, will funding to the Northeastern PHAs be reduced more than other areas of the country?

Answer: The FMR-based system will treat Northeastern PHAs less generously than those in other areas of the country but only because: (1) these PHAs have had high costs historically, which the PFS system has reinforced; and (2) these PHAs have relative inefficiency in utility utilization compared to their private market counterparts. However, these PHAs would be priority candidates to receive transition modernization funds, which will reduce operating costs and improve the position of these PHAs vis-a-vis FMR funding.

Question: What factors account for the major differences between regions?

Answer: The major factors which explain differences in subsidy levels that PHAs in different regions receive are:

- relative efficiency of energy consumption vis-a-vis the private market;
- relative cost of management and routine maintenance costs;
- Fair Market Rent levels; and
- influence of rent control on the Fair Market standard.

The differences between PHAs within the same region are considerably much greater than the differences between regions. This is reflected in HUD's PHA-by-PHA estimates.

Question: Please prepare a list of the major PHAs by region showing their funding under PFS and FMRs.

Answer: See attached list.

FY 1984 FMR and PFS OPERATING SUBSIDIES

The attached table provides the Department of Housing and Urban Development's current estimates of the subsidies Public Housing Authorities (PHA's) will receive for 1984 under the proposed new system for providing operating and replacement funds for public housing projects.

The new funding system will provide a single subsidy to PHA's for the costs of operating public housing projects and making replacements and capital improvements.

The formula under which the new subsidy is calculated is based on the existing housing Fair Market Rents (FMR's), or Payment Standards, used to determine subsidy amounts in the Section 8 Existing Housing Program and the proposed Housing Payment Certificates Program. Each PHA will receive a subsidy calculated as follows:

Fair Market Rent X number of units
- minus tenant rents
- minus debt service (lesser of actual debt service or 20 percent of FMR)

= FMR subsidy payment

If the FMR subsidy provides PHA's with a "windfall" - more funds than would be available under the old Performance Funding System (PFS) plus a replacement allowance - such PHA's will receive their PFS amount plus a replacement allowance in 1984. In subsequent years, such PHA's will receive funding based on their 1984 funding level, plus an inflation adjustment that reflects increases in FMR's.

Over 90% of the nation's PHA's will continue to receive as much subsidy funds under the new system as under PFS and will, in addition, receive a replacement allowance. These are called "Market PHA's." A few PHA's would receive less on the basis of the new formula and are called "Transition PHA's." For Transition PHA's, the new funding system provides for a transition that ensures they will receive at least 95 percent of the total funds that they would have received for operating their projects in 1984 under the PFS (total funds = subsidy plus rents charged to tenants), plus a replacement allowance. This transition amount will phase down in subsequent years until FMR-based levels are reached.

In addition, these PHA's will receive separate transition modernization funds during a four-year transition period to help them make energy-saving capital improvements and to take care of their backlogs of current repair needs.

EXPLANATION OF TABLE

The first column of the table (FMR subsidy) is an estimate of the amount each PHA will receive under the new operating/replacement subsidy system in 1984. This amount, in addition to the basic formula described above, includes the following adjustments: (1) for units in projects over 6 stories and with a majority of family occupants, the FMR is 118% of the otherwise applicable FMR; (2) tenant paid utilities are deducted from both FMR's and tenant rents (this adjustment has not been made in all cases, because of incomplete data). This amount also includes transition funds provided through the phase-down of subsidies for Transition PHA's as described above. It does not include transition modernization funds, which will be provided separately under the Comprehensive Improvement Assistance Program (CIAP).

The second column (PFS Subsidy) is an estimate of the amount for 1984 that would be calculated for each PHA under the current PFS. It does not include reductions to the PFS that will result from the rolling utilities base, or any reductions that might be made to take account of flaws in the PFS. Thus, the amount estimated for PFS subsidy is overstated for some PHA's.

The third column (FMR Subsidy if No Transition) is an estimate of the amount each PHA would receive in 1984 if no transition were provided for PHA's that may need to reduce operating cost levels. It does not represent the amounts PHA's will receive in any subsequent year; as Transition PHA's are phased down to FMR-based levels, FMR-based levels will rise with year to year increases in private market rents.

The fourth column (Replacement Allowance) is an estimate of a reasonable amount for PHA's to spend, or reserve for future use, for replacements and capital improvements needed as their projects continue to age. It is calculated to be 20 percent of the PHA's non-utilities operating expenses permitted under the PFS as of 1984. (Note that this figure, shown here separately, is included in the FMR figures shown in columns 1 and 3.)

Totals are the total subsidy amounts for all units defined as available for occupancy as of 1982. "PUM" amounts are subsidy amounts per unit month.

These estimates for 1984 must be viewed as approximations of amounts that will actually be received in that year, since they include inflation assumptions and are based on the best available current data for these PHA's, both of which are subject to change between now and 1984. In addition, they do not include (1) a policy change providing upward adjustments to FMR's for larger units (3 or more bedrooms) which is under consideration for the Housing Payment Certificates Program. These adjusted FMR's would also apply to public housing; and (2) deductions from subsidy for PHA's that have units not eligible for payment because of vacancies or substandard condition.

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

FY 1984 FMR AND PFS OPERATING SUBSIDIES*

	1		2		3		4		
	PROPOSED FMR SUBSIDY		PFS SUBSIDY		PROPOSED FMR SUBSIDY IF NO TRANSITION		REPLACEMENT ALLOWANCE		
PHA NAME	TOTAL	PUM	TOTAL	PUM	TOTAL	PUM	TOTAL	PUM	HUD REGION
BRIDGEPORT CT	7239743.	205.	6812487.	193.	7206118.	204.	1046617.	30.	1.
LEWISTON ME	553182.	104.	450467.	85.	553182.	104.	104018.	20.	1.
NEW LONDON CT	265441.	96.	205137.	74.	265441.	96.	60304.	22.	1.
RUTLAND VT	305275.	118.	284392.	110.	263821.	102.	56453.	22.	1.
WATERBURY CT	1344999.	158.	1151501.	135.	1344999.	158.	210730.	25.	1.
CENTRL FALLS RI	451687.	111.	368182.	91.	451687.	111.	87023.	21.	1.
BRISTOL CT	695145.	105.	577723.	87.	695145.	105.	117422.	18.	1.
BURLINGTON VT	508013.	129.	469339.	119.	432268.	110.	94266.	24.	1.
WILLIMANTIC CT	430126.	140.	405780.	132.	379391.	123.	64227.	21.	1.
PORTLAND ME	2045179.	162.	1964254.	156.	2032822.	161.	263984.	21.	1.
MIDDLETOWN CT	742076.	141.	706775.	135.	592798.	113.	113546.	22.	1.
PROVIDENCE RI	4838084.	159.	4137327.	136.	4838084.	159.	700757.	23.	1.
STAMFORD CT	2377668.	184.	2005374.	155.	2377668.	184.	372294.	29.	1.
WORCESTER MA	3976033.	143.	3355480.	121.	3976033.	143.	688169.	25.	1.
E HARTFORD CT	743644.	103.	573655.	79.	743644.	103.	169989.	23.	1.
WOONSOCKET RI	1194426.	77.	874745.	57.	1194426.	77.	319681.	21.	1.
NEW HAVEN CT	8828253.	226.	8317565.	213.	8171776.	210.	1185559.	30.	1.
CAMBRIDGE MA	5069572.	232.	4672616.	213.	5069572.	232.	669773.	31.	1.
HARTFORD CT	6223051.	183.	5410837.	160.	6223051.	183.	942493.	28.	1.
PAWTUCKET RI	1655345.	117.	1548460.	109.	1655345.	117.	275151.	19.	1.
DANBURY CT	593039.	133.	478719.	107.	593039.	133.	114320.	26.	1.
FRAMINGHAM MA	145871.	95.	110149.	72.	145871.	95.	35723.	23.	1.
SOMERVILLE MA	1320410.	245.	1272003.	236.	1301162.	241.	149517.	28.	1.
HOLYOKE MA	1454032.	142.	1323398.	130.	1324945.	130.	266347.	26.	1.
LAWRENCE MA	2087645.	160.	1944558.	149.	1954287.	150.	335989.	26.	1.
BOSTON MA	45879847.	289.	43988705.	278.	41537793.	262.	5005136.	32.	1.
LOWELL MA	3252471.	163.	2676058.	134.	3252471.	163.	576414.	29.	1.
CONCORD NH	156007.	50.	114319.	36.	156007.	50.	41688.	13.	1.
WATERVILLE ME	277526.	125.	266149.	120.	269748.	122.	40694.	18.	1.
NEW BEDFORD MA	2752502.	135.	2311056.	114.	2752502.	135.	441446.	22.	1.
FALL RIVER MA	3388394.	146.	2834580.	122.	3388394.	146.	553814.	24.	1.

MALDEN MA	1247803.	117.	973104.	92.	1247803.	117.	274699.	26.	1.
MANCHESTFR NH	1916231.	132.	1553795.	107.	1916231.	132.	362436.	25.	1.
NASHUA NH	540553.	101.	431412.	81.	540553.	101.	109141.	20.	1.
WOBURN MA	1848112.	150.	1523707.	124.	1848112.	150.	324405.	26.	1.
BROCKTON MA	2054187.	132.	1696908.	109.	2054187.	132.	357279.	23.	1.
DOVER NH	453939.	86.	379448.	72.	453939.	86.	74491.	14.	1.
TRENTON NJ	5128444.	213.	4860779.	202.	3505900.	146.	688626.	29.	2.
JERSEY CITY NJ	14846278.	324.	14348905.	314.	6868184.	150.	1532269.	33.	2.
ORANGE NJ	1184622.	182.	1102874.	170.	849508.	131.	190664.	29.	2.
HADDON TWP NJ	118643.	96.	98580.	80.	118643.	96.	20063.	16.	2.
HOBOKEN NJ	3072300.	184.	2936652.	176.	2078441.	125.	435190.	26.	2.
PATERSON NJ	5726683.	195.	5393803.	183.	5386924.	183.	838420.	28.	2.
PASSAIC NJ	1278952.	165.	1071172.	138.	1278952.	165.	247138.	32.	2.
WEST NY NJ	1131060.	125.	1045385.	115.	889728.	98.	217644.	24.	2.
ASBURY PARK NJ	1293921.	177.	1090778.	150.	1293921.	177.	203142.	28.	2.
LONG BRANCH NJ	1184502.	150.	1000529.	126.	1184502.	150.	183973.	23.	2.
ELIZABETH NJ	2987289.	154.	2481384.	128.	2987289.	154.	505904.	26.	2.
ATLNTIC CITY NJ	3188008.	157.	2926632.	144.	2075240.	102.	582163.	29.	2.
IRVINGTON NJ	983278.	118.	938766.	113.	944644.	114.	148662.	18.	2.
PERTH AMBOY NJ	2716117.	292.	2654692.	286.	1712349.	184.	269671.	29.	2.
LAKEWOOD NJ	480164.	145.	413790.	125.	480164.	145.	66373.	20.	2.
SYRACUSE NY	4952191.	177.	4541435.	162.	2948880.	105.	846169.	30.	2.
BINGHAMTON NY	448772.	60.	275799.	37.	448772.	60.	172973.	23.	2.
PLATTSBURGH NY	234508.	41.	119104.	21.	234508.	41.	115404.	20.	2.
WATERVLIET NY	255341.	68.	187208.	50.	255341.	68.	68132.	18.	2.
ROCHESTER NY	4270331.	162.	3356748.	127.	4270331.	162.	913583.	35.	2.
KINGSTON NY	216499.	120.	190127.	106.	196758.	109.	52555.	29.	2.
NY CITY NY	374353562.	206.	329190047.	181.	345436486.	190.	81044281.	45.	2.
BUFFALO NY	9803710.	159.	8645119.	140.	6248454.	101.	2105746.	34.	2.
HORNELL NY	212595.	108.	176066.	89.	212595.	108.	48247.	24.	2.
PENNS GROVE NJ	266198.	141.	221953.	118.	266198.	141.	44245.	23.	2.
NEWARK NJ	46055978.	290.	43476463.	274.	31853454.	201.	5667135.	36.	2.
OYSTER BAY NY	675332.	71.	473612.	50.	675332.	71.	201720.	21.	2.
ALBANY NY	3848051.	172.	3500686.	157.	2454627.	110.	717086.	32.	2.
GLOVERSVILLE NY	443576.	119.	394794.	106.	270003.	73.	94413.	25.	2.
WATERTOWN NY	380470.	58.	274585.	42.	380470.	58.	105885.	16.	2.
NORTH BERGEN NJ	1419854.	117.	1330505.	110.	1263367.	104.	235800.	19.	2.
BAYONNE NJ	2293741.	144.	2094527.	131.	1673747.	105.	433087.	27.	2.
TROY NY	1938159.	159.	1779969.	146.	1806374.	148.	341905.	28.	2.
HEMPSTEAD NY	1384310.	113.	1113761.	91.	1384310.	113.	270549.	22.	2.
NEPTUNE TWP NJ	552574.	130.	442191.	104.	552574.	130.	110383.	26.	2.

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	TOTAL	PUM	TOTAL	PUM	TOTAL	PUM	TOTAL	PUM	
WILMINGTON DE	6769236.	213.	6503329.	205.	6082964.	191.	788148.	25.	3.
NEWPORT NEWS VA	2528869.	114.	1970183.	89.	2528869.	114.	558686.	25.	3.
NCHA DC	33817145.	241.	29343947.	209.	33817145.	241.	4473198.	32.	3.
BETHLEHEM PA	2107514.	136.	1744610.	113.	2107514.	136.	362904.	23.	3.
PORTSMOUTH VA	3270644.	139.	2663314.	113.	3270644.	139.	607330.	26.	3.
ANNE ARUNDEL MD	959569.	92.	760766.	73.	959569.	92.	198802.	19.	3.
NORFOLK VA	8884171.	178.	7538814.	151.	8884171.	178.	1345357.	27.	3.
ALLENTOWN PA	1885458.	116.	1486089.	91.	1885458.	116.	399369.	25.	3.
HAMPTON VA	1835481.	150.	1526324.	124.	1835481.	150.	309157.	25.	3.
MTGOMERY CO MD	1196910.	109.	954930.	87.	1196910.	109.	241980.	22.	3.
DANVILLE VA	465490.	61.	359623.	47.	465490.	61.	105867.	14.	3.
HARRISBURG PA	3308923.	173.	3018044.	158.	3308923.	173.	465407.	24.	3.
RICHMOND VA	9835180.	182.	8416077.	156.	9835180.	182.	1419103.	26.	3.
CUMBERLAND MD	249623.	47.	168870.	32.	249623.	47.	80753.	15.	3.
CHESAPEAKE VA	363029.	92.	274450.	69.	363029.	92.	88579.	22.	3.
MTGOMERY CO PA	1185065.	164.	1008314.	139.	1185065.	164.	176751.	24.	3.
ROANOKE VA	2263534.	129.	1783780.	102.	2263534.	129.	479754.	27.	3.
HAGERSTOWN MD	885338.	68.	644650.	50.	885338.	68.	240689.	19.	3.
CHARLESTON WV	2549755.	145.	2132555.	122.	2549755.	145.	417200.	24.	3.
ALLEGHENY CO PA	4832547	98.	3651183.	74.	4832547.	98.	1181364.	24.	3.
LYNCHBURG VA	291850.	118.	243381.	99.	291850.	118.	48468.	20.	3.
BALTIMORE MD	43895786.	206.	40430183.	190.	43895786.	206.	6625521.	31.	3.
ALEXANDRIA VA	756554.	65.	503158.	43.	756554.	65.	253396.	22.	3.
READING PA	2439147.	122.	2237370.	112.	2250072.	113.	440184.	22.	3.
FAIRFAX CO VA	665714.	129.	536051.	104.	665714.	129.	129663.	25.	3.
SCRANTON PA	2870635.	181.	2702058.	170.	1609670.	101.	417189.	26.	3.
PETERSBURG VA	748137.	153.	622231.	128.	748137.	153.	125906.	26.	3.
SCHUYLKILL CO PA	450036.	70.	329475.	51.	450036.	70.	124845.	19.	3.
PITTSBURGH PA	16106218.	137.	13671194.	116.	16106218.	137.	3134890.	27.	3.
BEAVER CO PA	1399200.	62.	951340.	42.	1399200.	62.	447860.	20.	3.
FAYETTE CO PA	1249177.	72.	898697.	52.	1249177.	72.	350480.	20.	3.
PHILADELPHIA PA	80126726.	281.	75459201.	265.	80097225.	281.	9328189.	33.	3.
EASTON PA	1013300.	137.	843819.	114.	1013300.	137.	169481.	23.	3.
LAWRENCE CO PA	933206.	77.	734091.	60.	933206.	77.	218526.	18.	3.
ERIE PA	1784964.	88.	1352438.	67.	1784964.	88.	432526.	21.	3.
CHESTER PA	4215103.	201.	4046831.	193.	3672637.	176.	513411.	25.	3.
DAUPHIN CO PA	624202.	78.	475646.	59.	624202.	78.	148556.	19.	3.

LANCASTER PA	866278.	125.	720849.	104.	866278.	125.	145430.	21.	3.
ALTOONA PA	353888.	57.	230080.	37.	353888.	57.	123809.	20.	3.
WESTMORELD CO PA	1497221.	75.	1072067.	54.	1497221.	75.	425154.	21.	3.
LACKAWANNA CO PA	632383.	48.	445490.	34.	632383.	48.	237833.	18.	3.
MIFFLIN CO PA	173627.	64.	124190.	46.	173627.	64.	49437.	18.	3.
WASHINGTON CO PA	756418.	88.	573454.	67.	756418.	88.	182964.	21.	3.
CLINTON CO PA	424920.	80.	331956.	63.	424920.	80.	92964.	18.	3.
MOUNTOUR CO PA	70243.	50.	47830.	34.	70243.	50.	22413.	16.	3.
JOHNSTOWN PA	1856754.	90.	1394160.	68.	1856754.	90.	462594.	22.	3.
MERCER CO PA	578700.	80.	399700.	55.	578700.	80.	179000.	25.	3.
YORK PA	1072711.	126.	867041.	102.	1072711.	126.	205670.	24.	3.
HAZELTON PA	145429.	39.	108871.	29.	98885.	27.	74825.	20.	3.
ANDALUSIA AL	78955.	53.	46707.	32.	78955.	53.	32249.	22.	4.
CANTON MS	117793.	64.	88693.	48.	117793.	64.	29100.	16.	4.
W PALM BEACH FL	455197.	58.	289035.	37.	455197.	58.	166162.	21.	4.
COLUMBIA SC	1960827.	81.	1483023.	61.	1960827.	81.	477804.	20.	4.
ANNISTON AL	454208.	53.	323984.	38.	454208.	53.	130223.	15.	4.
FAYETTEVILLE NC	1074439.	99.	839659.	78.	1074439.	99.	234781.	22.	4.
PENSACOLA FL	853216.	117.	707953.	97.	853216.	117.	145264.	20.	4.
CHARLESTON SC	2325912.	93.	1888607.	76.	2325912.	93.	437306.	18.	4.
TUSKEGEE AL	574486.	117.	466337.	95.	574486.	117.	108149.	22.	4.
BILOXI MS	732349.	68.	537571.	50.	732349.	68.	194778.	18.	4.
TAMPA FL	6496064.	114.	5370274.	94.	6496064.	114.	1125790.	20.	4.
MEMPHIS TN	13937450.	160.	12045056.	139.	13937450.	160.	1892394.	22.	4.
BIRMINGHAM AL	9472934.	115.	7486888.	91.	9472934.	115.	1986046.	24.	4.
MISS REG VII MS	63006.	43.	45256.	31.	63006.	43.	17750.	12.	4.
LAKELAND FL	537017.	62.	379307.	44.	537017.	62.	157710.	18.	4.
SPARTANBURG SC	1463422.	81.	1082786.	60.	1463422.	81.	380636.	21.	4.
FLORENCE AL	1201984.	147.	996689.	122.	1201984.	147.	205296.	25.	4.
GREENSBORO NC	2880263.	100.	2170465.	76.	2880263.	100.	709798.	25.	4.
FT MYERS FL	956702.	73.	715571.	54.	956702.	73.	241131.	18.	4.
GREENVILLE SC	476036.	38.	306004.	24.	476036.	38.	170032.	14.	4.
MOBILE AL	5494114.	109.	4538092.	90.	5494114.	109.	956022.	19.	4.
CHARLOTTE NC	4029314.	91.	3322756.	75.	4029314.	91.	706559.	16.	4.
FORT PIERCE FL	323980.	37.	167434.	19.	323980.	37.	156546.	18.	4.
JOHNSON CITY TN	687567.	85.	501036.	62.	687567.	85.	186531.	23.	4.
JASPER AL	263247.	63.	193679.	46.	263247.	63.	69568.	17.	4.
RALEIGH NC	2419159.	111.	1988462.	91.	2419159.	111.	430697.	20.	4.
ST PETERSBRG FL	963097.	78.	731707.	59.	963097.	78.	231390.	19.	4.
CHATTANOOGA TN	3581407.	79.	2830608.	62.	3581407.	79.	750799.	17.	4.

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	TOTAL	PUM	TOTAL	PUM	TOTAL	PUM	TOTAL	PUM	
UNION SPRNGS AL	111732.	60.	85251.	46.	111732.	60.	26481.	14.	4.
NEW BERN NC	805009.	113.	649876.	91.	805009.	113.	155133.	22.	4.
LEVY CO FL	71886.	47.	47902.	31.	71886.	47.	23984.	16.	4.
LAKE CITY SC	271999.	85.	222486.	69.	271999.	85.	49514.	15.	4.
MONTGOMERY AL	2898613.	94.	2320533.	75.	2898613.	94.	578081.	19.	4.
KINSTON NC	382661.	42.	255582.	28.	382661.	42.	127079.	14.	4.
TALLAHASEE FL	643332.	98.	519299.	79.	643332.	98.	124033.	19.	4.
CLINTON TN	61267.	33.	39276.	21.	61267.	33.	21991.	12.	4.
OPELIKA AL	340356.	48.	222238.	31.	340356.	48.	118118.	17.	4.
ELIZABETH CTY NC	352455.	87.	280991.	69.	352455.	87.	71464.	18.	4.
DE LAND FL	239856.	97.	197324.	80.	239856.	97.	42532.	17.	4.
FRANKLIN TN	211910.	56.	153642.	40.	211910.	56.	58269.	15.	4.
HUNTSVILLE AL	2602229.	120.	2104101.	97.	2602229.	120.	498127.	23.	4.
LAUREL MS	337306.	40.	209919.	25.	337306.	40.	127387.	15.	4.
JACKSONVILLE FL	4877867.	123.	4230787.	107.	4877867.	123.	647081.	16.	4.
MORRISTOWN TN	336474.	51.	239389.	37.	336474.	51.	97085.	15.	4.
TUSCALOOSA AL	638796.	54.	464687.	39.	638796.	54.	174109.	15.	4.
WILMINGTON NC	2435693.	119.	1973636.	96.	2435693.	119.	462057.	23.	4.
AUGUSTA GA	2338435.	68.	1773052.	52.	2338435.	68.	565383.	17.	4.
LAFOLLETTE TN	841105.	69.	636666.	52.	841105.	69.	204439.	17.	4.
PHENIX AL	1042879.	90.	848451.	73.	1042879.	90.	194428.	17.	4.
SANFORD NC	257906.	49.	184414.	35.	257906.	49.	73492.	14.	4.
SAVANNAH GA	3683975.	130.	3112768.	110.	3683975.	130.	571207.	20.	4.
LAWRENCEBURG TN	144397.	53.	98721.	36.	144397.	53.	45676.	17.	4.
RUSSELLVILLE AL	180230.	101.	144597.	81.	180230.	101.	35632.	20.	4.
LUMBERTON NC	1066049.	130.	886242.	108.	1066049.	130.	179807.	22.	4.
ATHENS GA	1734399.	114.	1387598.	91.	1734399.	114.	346801.	23.	4.
MARYVILLE TN	133671.	54.	99276.	40.	133671.	54.	34395.	14.	4.
GUNTERSVILLE AL	209680.	52.	145788.	36.	209680.	52.	63892.	16.	4.
HATTIESBURG MS	76990.	26.	36324.	12.	76990.	26.	40666.	14.	4.
ORLANDO FL	1754554.	98.	1347278.	75.	1754554.	98.	407276.	23.	4.
JACKSON TN	1221338.	100.	1000294.	82.	1221338.	100.	221043.	18.	4.
COLUMBIANA AL	101804.	64.	68728.	43.	101804.	64.	33076.	21.	4.
SALISBURY NC	285238.	41.	179235.	26.	285238.	41.	106003.	15.	4.
MCDONOUGH GA	34589.	25.	14082.	10.	34589.	25.	20507.	15.	4.
NASHVILLE TN	11758843.	153.	9784084.	128.	11758843.	153.	1974759.	26.	4.

FORT PAYNE AL	145600.	43.	91913.	27.	145600.	43.	53687.	16.	4.
GOLDSBORO NC	776045.	51.	505407.	33.	776045.	51.	270638.	18.	4.
COLUMBUS GA	2296457.	88.	1734433.	67.	2296457.	88.	562024.	22.	4.
KNOXVILLE TN	6587375.	145.	5575481.	122.	6587375.	145.	1011894.	22.	4.
ATHENS AL	88935.	52.	64235.	37.	88935.	52.	24700.	14.	4.
WINSTONSALEM NC	2985411.	117.	2417478.	95.	2985411.	117.	567934.	22.	4.
MACON GA	2290841.	88.	1769320.	68.	2290841.	88.	521520.	20.	4.
LEXINGTON TN	50001.	34.	28916.	20.	50001.	34.	21085.	14.	4.
RED BAY AL	66666.	46.	43707.	30.	66666.	46.	22959.	16.	4.
HIGH POINT NC	1736782.	101.	1440965.	84.	1736782.	101.	295817.	17.	4.
DADE CO FL	15196124.	127.	12260083.	103.	15196124.	127.	2936041.	25.	4.
N WILKESBORO NC	1.	0.	1.	0.	1.	0.	27047.	11.	4.
GEORGIANA AL	36444.	30.	23175.	19.	36444.	30.	13268.	11.	4.
MERIDIAN MS	519911.	56.	339993.	37.	519911.	56.	179918.	20.	4.
ROME GA	556966.	41.	382386.	28.	556966.	41.	174581.	13.	4.
TENN VAL REG MS	572677.	62.	368145.	40.	572677.	62.	204532.	22.	4.
ATLANTA GA	29572909.	161.	25114373.	137.	29572909.	161.	4458536.	24.	4.
DURHAM NC	2940274.	114.	2374214.	92.	2940274.	114.	566060.	22.	4.
DOUGLAS CITY GA	259612.	47.	188176.	34.	259612.	47.	71436.	13.	4.
WILSON NC	460200.	58.	331459.	42.	460200.	58.	128741.	16.	4.
PAHOKEE FL	146539.	23.	19811.	3.	146539.	23.	126728.	20.	4.
ALBANY GA	293962.	31.	162847.	17.	293962.	31.	131115.	14.	4.
MARIETTA GA	675343.	68.	477209.	48.	675343.	68.	198134.	20.	4.
LYONS GA	111504.	68.	80970.	49.	111504.	68.	30534.	19.	4.
PINELLAS CO FL	261074.	44.	145645.	24.	261074.	44.	115429.	19.	4.
METTER GA	103491.	69.	80546.	54.	103491.	69.	22945.	15.	4.
GAINESVILLE GA	253317.	41.	144579.	23.	253317.	41.	108738.	18.	4.
COVINGTON KY	1604645.	131.	1333153.	108.	1604645.	131.	275762.	22.	4.
MONTEZUMA GA	141879.	70.	109592.	54.	141879.	70.	32287.	16.	4.
PADUCAH KY	1009548.	74.	765325.	56.	1009548.	74.	244224.	18.	4.
LOUISVILLE KY	11569197.	155.	9910108.	133.	11569197.	155.	1659089.	22.	4.
NEWPORT KY	539177.	76.	413893.	59.	539177.	76.	125284.	18.	4.
CONYERS GA	142511.	48.	87298.	29.	142511.	48.	55213.	19.	4.
WHITESBURG KY	30527.	24.	9213.	7.	30527.	24.	21314.	17.	4.
QUITMAN GA	66249.	39.	41685.	25.	66249.	39.	24564.	15.	4.
HARLAN KY	56488.	25.	25824.	12.	56488.	25.	30664.	14.	4.
MIDDLESBOROUG KY	113395.	26.	46812.	11.	113395.	26.	66582.	15.	4.
CARROLLTON KY	104625.	65.	76425.	48.	104625.	65.	28199.	18.	4.
LEXINGTON KY	2775168.	122.	2384002.	105.	2775168.	122.	391166.	17.	4.
SOMERSET KY	32801.	39.	55416.	26.	82801.	39.	27385.	13.	4.

PHA NAME	PROPOSED FMR SUBSIDY		PFS SUBSIDY		PROPOSED FMR SUBSIDY IF NO TRANSITION		REPLACEMENT ALLOWANCE		HUD REGION
	TOTAL	PUM	TOTAL	PUM	TOTAL	PUM	TOTAL	PUM	
MADISON WI	472887.	67.	310175.	44.	472887.	67.	162711.	23.	5.
DANVILLE IL	476280.	53.	334333.	37.	476280.	53.	141946.	16.	5.
YOUNGSTOWN OH	2411566.	104.	1974504.	85.	2411566.	104.	437063.	19.	5.
WILLIAMSON CO IL	815101.	95.	647020.	75.	815101.	95.	168080.	19.	5.
MANITOWOC WI	35818.	29.	14630.	12.	35818.	29.	21188.	17.	5.
SALINE CO IL	286724.	62.	211870.	46.	286724.	62.	74854.	16.	5.
LUCAS CO OH	7137303.	180.	6814041.	171.	6470599.	163.	847319.	21.	5.
ROCK ISLAND IL	899467.	120.	734060.	98.	899467.	120.	165407.	22.	5.
MILWAUKEE WI	6995013.	125.	5482979.	98.	6995013.	125.	1512034.	27.	5.
COOK CO IL	2299000.	96.	1811337.	75.	2299000.	96.	487663.	20.	5.
BUTLER OH	583559.	43.	386046.	28.	583559.	43.	197512.	15.	5.
PFORIA IL	3164143.	136.	2625112.	113.	3164143.	136.	539032.	23.	5.
COLUMBUS OH	6749218.	113.	5532614.	93.	6749218.	113.	1216603.	20.	5.
ROCKFORD IL	2849056.	154.	2354799.	127.	2849056.	154.	494258.	27.	5.
SPRINGFIELD OH	715238.	78.	543199.	60.	715238.	78.	172039.	19.	5.
ST CLAIR CO IL	1103678.	104.	871525.	82.	1103678.	104.	232153.	22.	5.
CUYAHOGA OH	28822116.	200.	26897986.	187.	24394959.	169.	4011014.	28.	5.
MADISON CO IL	826662.	79.	624765.	60.	826662.	79.	201897.	19.	5.
CINCINNATI OH	12206862.	145.	11201311.	133.	10738983.	127.	2132385.	25.	5.
CHICAGO IL	117720365.	246.	100839852.	211.	117720365.	246.	16880513.	35.	5.
DAYTON OH	4985776.	97.	3998738.	78.	4985776.	97.	987038.	19.	5.
ELGIN IL	229964.	73.	171532.	55.	229964.	73.	58432.	19.	5.
STARK OH	2294628.	85.	1783516.	66.	2294628.	85.	511112.	19.	5.
RANDOLPH CO IL	101358.	37.	62656.	23.	101358.	37.	38702.	14.	5.
AKRON OH	5465780.	99.	4105670.	74.	5465780.	99.	1360110.	25.	5.
EFFINGHAM IL	86424.	67.	60558.	47.	86424.	67.	25867.	20.	5.
TRUMBALL OH	1198747.	70.	894760.	53.	1198747.	70.	303987.	18.	5.
E ST LOUIS IL	3521248.	109.	2888932.	89.	3521248.	109.	632316.	19.	5.
PORTSMOUTH OH	834709.	84.	626386.	63.	834709.	84.	208323.	21.	5.
MARION CO IL	327423.	68.	241670.	50.	327423.	68.	85752.	18.	5.
LORAIN OH	1618053.	95.	1269642.	74.	1618053.	95.	348411.	20.	5.
WHITE IL	120604.	84.	93739.	66.	120604.	84.	26865.	19.	5.
BLOOMINGTON IL	676956.	86.	513654.	65.	676956.	86.	163302.	21.	5.
SPRINGFIELD IL	1922856.	115.	1549474.	93.	1922856.	115.	373383.	22.	5.
INDIANAPOLIS IN	4304540.	133.	3674521.	114.	4304540.	133.	630019.	20.	5.
EVANSVILLE IN	926375.	67.	648809.	47.	926375.	67.	277566.	20.	5.
ELKHART IN	487412.	74.	372039.	56.	487412.	74.	115373.	17.	5.

JOLIET IL	1344442.	99.	1014423.	75.	1344442.	99.	330019.	24.	5.
GARY IN	3680458.	132.	3061489.	110.	3680458.	132.	618969.	22.	5.
WASHINGTON IN	112976.	48.	74349.	32.	112976.	48.	38627.	17.	5.
CHAMPAGNE CO IL	522214.	70.	359579.	48.	522214.	70.	162635.	22.	5.
GRANITE CITY IL	414055.	52.	283500.	35.	414055.	52.	130555.	16.	5.
HAMMOND IN	492267.	67.	375677.	51.	492267.	67.	116590.	16.	5.
JEFFERSONVIL IN	465705.	99.	372609.	79.	465705.	99.	93096.	20.	5.
DETROIT MI	23101160.	182.	19372571.	153.	23101160.	182.	3728589.	29.	5.
FRANKLIN CO IL	317671.	38.	207509.	25.	317671.	38.	110162.	13.	5.
SAGINAW MI	705719.	66.	485956.	45.	705719.	66.	219763.	20.	5.
FLINT MI	913226.	77.	638398.	54.	913226.	77.	274829.	23.	5.
YPSILANTI MI	113811.	41.	55428.	20.	113811.	41.	58383.	21.	5.
DEARBORN MI	231729.	57.	162675.	40.	231729.	57.	69053.	17.	5.
ROSEVILLE MI	66915.	53.	45280.	36.	66915.	53.	21634.	17.	5.
BIG RAPIDS MI	131981.	37.	76470.	22.	131981.	37.	55511.	16.	5.
LANSING MI	572450.	54.	312993.	30.	572450.	54.	259456.	25.	5.
INKSTER MI	939542.	89.	674866.	64.	939542.	89.	264677.	25.	5.
ST PAUL MN	5172070.	101.	3796538.	74.	5172070.	101.	1375532.	27.	5.
MINNEAPOLIS MN	8832304.	105.	6690223.	79.	8832304.	105.	2142082.	25.	5.
DULUTH MN	808255.	56.	561961.	39.	808255.	56.	246294.	17.	5.
ROMULUS MI	77653.	62.	43491.	35.	77653.	62.	34163.	27.	5.
MOORHEAD MN	79522.	33.	46742.	19.	79522.	33.	32780.	13.	5.
ELY MN	86302.	58.	63424.	43.	86302.	58.	22878.	15.	5.
HIBBING MN	148691.	47.	102477.	33.	148691.	47.	46214.	15.	5.
AUSTIN TX	2390474.	102.	1953020.	83.	2390474.	102.	437454.	19.	6.
FORT SMITH AR	284628.	51.	213905.	39.	284628.	51.	70722.	13.	6.
BROKEN BOW OK	60836.	35.	38369.	22.	60836.	35.	22466.	13.	6.
LEESVILLE LA	48359.	26.	24555.	13.	48359.	26.	23804.	13.	6.
HOUSTON TX	3813838.	104.	3083284.	84.	3813838.	104.	730554.	20.	6.
N LITTLE ROCK AR	1099563.	89.	878198.	71.	1099563.	89.	221365.	18.	6.
BRISTOW OK	22973.	16.	6501.	5.	22973.	16.	16472.	12.	6.
OPELOUSAS LA	342747.	43.	235927.	30.	342747.	43.	106821.	14.	6.
FORT WORTH TX	1237223.	77.	986419.	61.	1237223.	77.	250804.	16.	6.
WEST MEMPHIS AR	143181.	79.	108864.	60.	143181.	79.	34317.	19.	6.
CLOVIS NM	203228.	125.	168320.	104.	203228.	125.	34908.	21.	6.
ST JAMES LA	232478.	73.	175521.	55.	232478.	73.	56956.	18.	6.
BAYTOWN TX	136366.	74.	106732.	58.	136366.	74.	29635.	16.	6.
LITTLE ROCK AR	2040299.	98.	1662495.	80.	2040299.	98.	377804.	18.	6.
ALBUQUERQUE NM	664332.	73.	505099.	56.	664332.	73.	159233.	18.	6.
RAYVILLE LA	75890.	62.	54906.	45.	75890.	62.	20985.	17.	6.

	PROPOSED FMR SUBSIDY		PFS SUBSIDY		PROPOSED FMR SUBSIDY IF NO TRANSITION		REPLACEMENT ALLOWANCE		
PHA NAME	TOTAL	PUM	TOTAL	PUM	TOTAL	PUM	TOTAL	PUM	HUD REGION
SAN ANTONIO TX	12244306.	127.	10033190.	104.	12244306.	127.	2211116.	23.	6.
MONROE LA	745638.	41.	480368.	26.	745638.	41.	265270.	14.	6.
TULSA OK	3041259.	101.	2412290.	80.	3041259.	101.	628969.	21.	6.
LAKE CHARLES LA	188156.	19.	6270.	1.	188156.	19.	181887.	18.	6.
CORSICANA TX	227453.	60.	160502.	42.	227453.	60.	66951.	18.	6.
E BATON ROUGE LA	689319.	41.	501926.	30.	689319.	41.	187394.	11.	6.
OKLAHOMA OK	3062001.	84.	2320325.	63.	3062001.	84.	741676.	20.	6.
NEW ORLEANS LA	23145407.	139.	19611801.	118.	23145407.	139.	3533606.	21.	6.
CORPUS CHRIS TX	963281.	41.	520417.	22.	963281.	41.	442864.	19.	6.
DE RIDDER LA	52665.	34.	32898.	22.	52665.	34.	19768.	13.	6.
BROWNSVILLE TX	406171.	37.	219905.	20.	406171.	37.	186266.	17.	6.
NEW IBERIA LA	124359.	59.	88836.	42.	124359.	59.	35522.	17.	6.
LAREDO TX	419314.	42.	254225.	25.	419314.	42.	165089.	16.	6.
LAFOURCHE LA	186500.	76.	142114.	58.	186500.	76.	44386.	18.	6.
GALVESTON TX	1829651.	120.	1525555.	100.	1829651.	120.	304096.	20.	6.
WAXAHACHIE TX	39315.	31.	19953.	16.	39315.	31.	19362.	15.	6.
EL PASO TX	4312803.	59.	3219168.	44.	4312803.	59.	1093635.	15.	6.
WICHITA FALLS TX	318941.	41.	198468.	25.	318941.	41.	120472.	15.	6.
DALLAS TX	12221546.	146.	10415776.	124.	12221546.	146.	1805770.	22.	6.
TEMPLE TX	208463.	52.	147416.	37.	208463.	52.	61048.	15.	6.
MCALLEN TX	154108.	67.	116215.	51.	154108.	67.	37894.	16.	6.
WESLACO TX	240285.	108.	188202.	85.	240285.	108.	52082.	23.	6.
COLEMAN TX	59355.	37.	38801.	24.	59355.	37.	20554.	13.	6.
PECOS TX	30694.	19.	7001.	4.	30694.	19.	23693.	15.	6.
HARLINGEN TX	391358.	55.	282780.	40.	391358.	55.	108578.	15.	6.
BRENHAM TX	84493.	30.	38903.	14.	84493.	30.	45590.	16.	6.
EDINBURG TX	229799.	43.	167835.	32.	229799.	43.	61964.	12.	6.
NEW BOSTON TX	108998.	44.	75689.	31.	108998.	44.	33309.	14.	6.
ORANGE CO TX	61125.	34.	33418.	18.	61125.	34.	27707.	15.	6.
ALICE TX	75627.	29.	44962.	17.	75627.	29.	30665.	12.	6.
BELTON TX	85321.	55.	60966.	40.	85321.	55.	24355.	16.	6.
LEAVENWORTH KS	86525.	67.	67038.	52.	86525.	67.	19487.	15.	7.
MEXICO MO	148942.	57.	103167.	40.	148942.	57.	45774.	18.	7.
COLUMBIA MO	912950.	100.	745218.	82.	912950.	100.	167732.	18.	7.
WELLINGTON KS	20864.	17.	4132.	3.	20864.	17.	16732.	14.	7.
ST LOUIS MO	12604369.	152.	10396947.	125.	12604369.	152.	2207423.	27.	7.

OMAHA NE	2883859.	82.	2136510.	60.	2883859.	82.	747348.	21.	7.
KANSAS CITY KS	2891927.	111.	2353358.	90.	2891927.	111.	538569.	21.	7.
SPRINGFIELD MO	453962.	55.	306046.	37.	453962.	55.	147917.	18.	7.
CHARLESTON MO	227629.	71.	179462.	56.	227629.	71.	48167.	15.	7.
KANSAS CITY MO	3276310.	127.	2701268.	105.	3276310.	127.	575042.	22.	7.
ALAMOSA CO	90252.	40.	53303.	24.	90252.	40.	36949.	16.	8.
TRINIDAD CO	25877.	12.	1.	0.	25877.	12.	28003.	13.	8.
DENVER CO	7322889.	132.	6033953.	109.	7322889.	132.	1288935.	23.	8.
WALSENBURG CO	57900.	43.	37806.	28.	57900.	43.	20093.	15.	8.
BOULDER CO	206465.	55.	142773.	38.	206465.	55.	63692.	17.	8.
LAS VEGAS NV	4611358.	172.	3581014.	134.	4611358.	172.	1030344.	38.	9.
PHOENIX AZ	3358745.	138.	2733435.	112.	3358745.	138.	625310.	26.	9.
HAWAII HI	4992267.	85.	3510316.	60.	4992267.	85.	1481951.	25.	9.
KERN CO CA	633774.	64.	360089.	36.	633774.	64.	273685.	27.	9.
OAKLAND CA	6906425.	179.	5520556.	143.	6906425.	179.	1385869.	36.	9.
KINGS CO CA	475222.	146.	386377.	118.	475222.	146.	88845.	27.	9.
MESA AZ	104026.	82.	77722.	61.	104026.	82.	26304.	21.	9.
FRESNO CO CA	835424.	89.	531361.	57.	835424.	89.	304063.	32.	9.
SAN FRANCISCO CA	21922561.	253.	18433337.	213.	21922561.	253.	3489224.	40.	9.
CALEXICO CA	42529.	20.	1.	0.	42529.	20.	61376.	28.	9.
MONTEREY CO CA	319401.	65.	201644.	41.	319401.	65.	117757.	24.	9.
CON COSTA CO CA	1060364.	77.	715605.	52.	1060364.	77.	344759.	25.	9.
SACRAMENTO CA	1849663.	88.	1255913.	60.	1849663.	88.	593750.	28.	9.
OXNARD CA	618334.	64.	330350.	34.	618334.	64.	287984.	30.	9.
CHANDLER AZ	239542.	97.	180397.	73.	239542.	97.	59145.	24.	9.
RICHMOND CA	413059.	56.	251093.	34.	413059.	56.	161966.	22.	9.
LA CITY CA	11702103.	115.	8021217.	79.	11702103.	115.	3680887.	36.	9.
TULARE CO CA	27414.	7.	1.	0.	27414.	7.	107117.	26.	9.
TUCSON AZ	1044480.	119.	871489.	99.	1044480.	119.	172991.	20.	9.
SAN JOAQINE CA	1801983.	133.	1363022.	101.	1801983.	133.	438961.	32.	9.
FRESNO CA	1569603.	132.	1168321.	98.	1569603.	132.	401283.	34.	9.
SUTTER CO CA	111450.	50.	74439.	34.	111450.	50.	37010.	17.	9.
MARICOPA CO AZ	896766.	113.	722093.	91.	896766.	113.	174673.	22.	9.
LIVERMORE CA	215672.	140.	171275.	111.	215672.	140.	44397.	29.	9.
YOLO CO CA	189136.	51.	97144.	26.	189136.	51.	91992.	25.	9.
DOUGLAS CO OR	158798.	83.	113747.	60.	158798.	83.	45052.	24.	10
CLALLAM CO WA	144098.	43.	91469.	28.	144098.	43.	52628.	16.	10
LANE CO OR	703549.	95.	522666.	70.	703549.	95.	180883.	24.	10
GRANT CO WA	140542.	57.	84076.	34.	140542.	57.	56466.	23.	10
PORTLAND OR	3801443.	130.	3025516.	104.	3801443.	130.	775928.	27.	10

PHA NAME	PROPOSED FRM SUBSIDY TOTAL	PROPOSED FRM SUBSIDY PUM	PFS SUBSIDY TOTAL	PFS SUBSIDY PUM	PROPOSED FMR SUBSIDY IF NO TRANSITION TOTAL	PROPOSED FMR SUBSIDY IF NO TRANSITION PUM	REPLACEMENT ALLOWANCE TOTAL	REPLACEMENT ALLOWANCE PUM	HUD REGION
KING CO WA	3104462.	82.	2163835.	57.	3104462.	82.	940627.	25.	10
TACOMA WA	1410344.	80.	1037001.	59.	1410344.	80.	373344.	21.	10
EVERETT WA	635333.	98.	474063.	66.	635333.	88.	161270.	22.	10
BREMERTON WA	670647.	90.	496322.	67.	670647.	90.	174325.	23.	10
SEATTLE WA	6023654.	78.	4138556.	54.	6023654.	78.	1885098.	25.	10

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* ESTIMATES BASED ON FY 1982 DATA; SUBSIDIES FOR AUDITS AND DEPROGRAMMED UNITS ARE NOT INCLUDED, SINCE THEY WOULD BE REIMBURSED SEPARATELY AS THEY ARE NOW; TENANT-PAID UTILITIES HAVE NOT BEEN TAKEN INTO CONSIDERATION FOR A FEW OF THE LISTED PHA'S; FMR SUBSIDIES INCLUDE A REPLACEMENT ALLOWANCE, WHICH IS ALSO SHOWN SEPARATELY IN THE LAST COLUMN.

-FOR MARKET PHA'S, COLUMN 1 (1984 SUBSIDY) = COLUMN 2 (PFS SUBSIDY) + COLUMN 4 (REPLACEMENT ALLOWANCE).

-FOR TRANSITION PHA'S, COLUMN 1 (1984 SUBSIDY) = 95 PERCENT OF TOTAL FUNDS (SUBSIDY PLUS RENTS PLUS REPLACEMENT ALLOWANCE) MINUS RENTS.

URBAN HOMESTEADING

Under the Urban Homesteading Program, a total of $55 million has been appropriated through Fiscal Year 1982 to reimburse the FHA Insurance Funds for properties transferred to local governments.

The budget proposes an appropriation of $12 million for FY 1984, this is the same as the FY 83 level. Within the $12 million appropriation, $9 million will be used to support an estimated 818 single family properties to be transferred at an estimated average value of $11,000. Also within this appropriation, the Administration plans to use $3 million to support a proposed multifamily homesteading demonstration. This will allow the transfer of a minimum of 15 buildings, averaging 30 units each, for a total of approximately 450 dwelling units to be homesteaded.

Question: Has the total number of abandoned houses increased or decreased over the past six years?

Answer: HUD does not currently have sufficient nationwide data available to arrive at any definite conclusions to respond to this question. In some areas of the country, the number of abandoned houses has increased, while in other areas the number has decreased.

Question: Considering that HUD now owns over 18,000 single family homes, does it anticipate an expansion of the Urban Homesteading Program in the future?

Answer: The size of the Urban Homesteading Program is limited by city demand for participation in this effort, as well as the value and location of the properties in the HUD inventory. The Department's annual funding requests reflect an estimate of the value of HUD, Veterans Administration, and Farmers Home Administration properties to be transferred to localities which will participate in the Urban Homesteading program during the following fiscal year. Currently, 100 cities have active programs and most of the HUD inventory are not located in targeted Urban Homesteading areas. In addition, since the inception of the program, only 6,400 HUD properties have been used in the program. Therefore, we do not anticipate any significant expansion of the program in the near future.

Question: How long would the proposed multifamily homesteading demonstration last?

Answer: At this time, the Department proposes to operate the multifamily Urban Homesteading Demonstration through fiscal year 1984.

Question: What criteria is the Department using to select projects for inclusion in the program?

Answer: The basic criteria for the selection of multifamily projects to be included in the demonstration will be that all of these properties are HUD-held. Consideration will be given to both occupied and unoccupied structures. Other property criteria are yet to be developed.

Question: Also, has the Department determined what cities will participate in the Demonstration?

Answer: No. Cities will be invited to submit applications for participation in the demonstration, based on additional criteria to be developed when and if the demonstration proposal is approved. HUD intends to encourage a variety of local approaches in implementing the demonstration efforts.

Question: What will be the average value of the multifamily projects transferred under the program?

Answer: The average value of multifamily structures to be utilized in the Demonstration is estimated to be $200,000, based on a funding level of $3,000,000 and a minimum goal of 15 properties to be selected. The value per dwelling unit is projected to be under $7,000, based on a goal of 450 units to be homesteaded.

Question: Will HUD make repairs to the projects before they are transferred to local units of government?

Answer: No, as in the single family Urban Homesteading program, multifamily properties will be transferred to local units of government in an unrepaired condition.

Question: What impact does the Department believe the Homesteading program has had on reducing the nationwide housing abandonment problem?

Answer: The Urban Homesteading program cannot have a major impact in reducing overall property abandonment due to the small size of the program (only 6,400 properties transferred through fiscal year 1982), as well as to the limited focus of the program on HUD, VA, and FmHA properties only. However, the program is a useful tool to be used in conjunction with other community development activities, such as rehabilitation financing, to revitalize neighborhoods. It also provides homeownership opportunities to individuals and families who would be unlikely to afford homes if homestead properties were not available.

Question: Has HUD developed any national or regional directives dealing with "squatting" by non-paying residents in HUD-owned properties?

Answer: It has been the Department's experience that squatting in HUD-owned properties has been extremely limited in scope, and thus, no national or regional directives have been necessary.

Question: How significant is the "squatting" problem nationwide and what action is HUD taking to combat this problem?

Answer: As indicated in the response to the previous question, the problem is small. The only organized activity involving squatters in single family properties occurred in Philadelphia, and was dealt with as an illegal activity. Of the vacant units in HUD-owned multifamily properties nationwide, we are not presently having any significant squatter-related problems.

Question: HUD is also planning to make single-family homes available to charities to shelter the homeless. How is this effort related to the Urban Homesteading program?

Answer: HUD Regional Administrators have been instructed to determine where there are HUD-held single family homes that can be made available for leasing to local governments and local charitable or religious organizations to respond to the needs of the homeless. In addition, we have stressed to recipients of CDBG funds that the operating cost of a shelter for the homeless is an eligible public service activity.

This new HUD effort is not directly related to urban homesteading, and will not detract from local homesteading efforts. Localities participating in the Urban Homesteading program continue to have the first option to utilize all HUD-held single family properties located in their designated Homesteading areas and not exceeding the regulatory value ceiling (currently $15,000/structure).

SINGLE FAMILY MORTGAGES

Question: What is HUD doing in response to the increasing number of homeowners in default and threatened with the loss of their houses?

Answer: Every mortgagor under an FHA-insured mortgage which is threatened by foreclosure because of a monetary default is required to be considered for possible eligibility under the assignment program of the Department. Assignment requests generally will increase or decrease in relation to default and foreclosure fluctuations.

In addition, HUD has consistently encouraged mortgagees to extend forbearance relief to borrowers in financial difficulty. Each field office regularly conducts meetings with industry representatives and reviews mortgagee servicing operations; in each case, lenders are encouraged to extend forbearance whenever feasible. We have all agreed that foreclosure does not benefit anyone involved.

Also, under HUD's housing counseling program, HUD-approved counseling agencies are available on a voluntary basis to provide free housing counseling services to mortgagors in default.

Question: Are more mortgages being taken on assignment and if so, what is the increased cost?

Answer: In FY 1982, the Department paid claims totaling $113.3 million on the assignment of 3,920 single family mortgages. For FY 1983, the 1984 Budget assumed that there was a potential level of 5,160 assignments but that 2,800 assignments would be deterred through the implementation of the Temporary Mortgage Assistance Payments (TMAP) program. Because of recent legal problems, however, the TMAP program is not expected to be implemented in FY 1983.

Actual data for FY 1983 through February 28, 1983 as well as preliminary data for March and April indicate that the number of assignments could exceed 4,500 with claim payments estimated at $156.1 million. This would be a higher level than experienced in FY 1982 but still below the potential level of 5,160 assignments estimated for FY 1983.

Question: Is HUD actively involved in trying to have the mortgagees and homeowners work out problems concerning defaults before the mortgage is assigned to HUD?

Answer: Yes. In FY 1983 through February 28, 1983, of the 11,475 cases processed for assignment there were 2,712 cases (24%) returned to mortgagees for further servicing. In those instances HUD considers that, with forbearance, the mortgagor can bring the mortgage to current status. Additionally, the number of letters and calls each HUD office receives from defaulting mortgagors requesting assistance; the number of occasions where serious communication gaps exist between borrower and lender, when HUD can bring the parties together in work-out arrangements; the number of referrals to HUD-approved counseling agencies; and the directives which HUD has sent to the industry asking for early counseling referrals --all these activities reflect HUD's active efforts in resolving defaults and in preventing foreclosures.

Question: What is the mortgagee's responsibility in this regard and what pressure can HUD apply to assure that the mortgagee is protecting the Government's interest?

Answer: HUD Handbook 4330.1 establishes the procedures by which we expect mortgagees to service FHA-insured mortgages. In all events we expect mortgagees to develop and implement policies and procedures consistent with acceptable mortgage servicing practices. This includes diligent collection efforts, personal contact with the mortgagors, forbearance agreements where possible and the preservation of property where necessary.

In the event that mortgagees cannot or will not service FHA-insured mortgages in accordance with the established requirements, the mortgagee may be brought up before the Mortgagee Review Board for possible administrative sanctions. The sanctions may take several forms up to and including withdrawal of approval to participate in FHA mortgage insurance programs.

Question: Do mortgagees lack incentive to offer qualified homeowners mortgage relief when they know that HUD has an assignment and TMAP program to provide needed assistance?

Answer: The assignment program is a temporary relief measure which is being approved currently for approximately 17% of the default cases reviewed for assignment. Accordingly, mortgagees cannot consider that the assignment program, or the TMAP program when implemented, is a readily available solution in all cases. They must, in many cases, attempt forbearance and counseling prior to resorting to foreclosures and making a claim for HUD insurance. HUD will grant added interest compensation in its insurance claim when the mortgagee exercises forbearance prior to bringing foreclosure. This compensation is provided by paying the insurance rate rather than a generally lower debenture rate.

Question: Is it to the mortgagees' advantage to foreclose or let HUD provide relief?

Answer: Foreclosure is always costly and all costs are not fully reimbursed in an insurance claim. It is generally to the mortgagees' advantage to assign the mortgage to HUD without the cost and expense of foreclosure, possible eviction, property maintenance, etc.

Question: In fiscal year 1984, HUD is requesting an appropriation of $56.4 million to assist about 3,900 homeowners under the TMAP program. Given the recent legal problems with the TMAP program, can you realistically expect to obligate this money in FY 1984?

Answer: Because of recent legal actions, the Department now expects that implementation of the TMAP program will occur in FY 1984.

CDBG - SMALL CITIES PROGRAM

The Omnibus Budget Reconciliation Act of 1981 gave States the option to assume primary administrative responsibility for the Small Cities Program. States are free to develop policies and procedures for distributing funds as State and local priorities dictate, subject to the objectives and other requirements of the Act. In Fiscal Year 1982, 36 of the 50 States and Puerto Rico elected to assume responsibility for administering the small cities CDBG program. The Administration is proposing legislation that would require all States to assume responsibility for administering the small cities program in 1984.

Question: What evidence does HUD have to demonstrate cost-efficiency and effectiveness in a State-administered program versus a HUD-administered program?

Answer: Since the States have only recently implemented their programs, we do not have any measure of cost-efficiency yet; in fact, it may not be valid to try to compare efficiency given the variety of State programs, as well as certain State objectives such as involving more small communities in the program. States also have demonstrated a desire to provide intensive technical assistance to communities that want to apply for grants, as well as to assist those that are in the program. Additionally, States have tried to involve communities in the program that have never before participated. All of these objectives are staff intensive, thus it may not be fair to compare the cost efficiency of the State program with the HUD experience.

Effectiveness can best be measured in terms of the program's responsiveness to local need. In a study of the developmental needs of small cities done by HUD in 1977, the first priority need expressed by the smaller community was for basic water and sewer facilities; the States appear to have developed programs responsive to that need. Perhaps the most telling indication is the response of small city officials to the State program as indicated in the testimony to the Senate Subcommittee on Housing an Urban Affairs by J. Dexter Peach, Director, Resources, Community, and Economic Development Division, General Accounting Office. According to the testimony, which was based on a study by GAO in seven States, "91 percent of the small cities that received State grants and 66 percent of the unsuccessful applicants believed that the projects and activities encouraged by their State program were adequate to address the development needs of their communities." Additional findings which would seem to support the responsiveness of the State program to local needs includes:

-- "Seventy-nine percent of the grantees and 78 percent of the unsuccessful applicants said the State program allowed the same or wider variety of projects and activities than could be funded under the HUD program."

-- "Ninety percent of the grantees and 83 percent of the unsuccessful applicants said the State program allowed communities equal or more flexibility than HUD's program in determining population groups to serve."

-- "Eighty-five percent of the grantees and 82 percent of the unsuccessful applicants said that the emphasis or order of the State's priorities is equal to or more consistent with the community's priority of development needs than under the HUD-administered program."

Question: Since most States have opted to take over the program voluntarily, why does the Administration wish to force the remaining States to administer the program?

Answer: It is precisely because most States have opted to administer the program that has prompted HUD to seek legislation to mandate State administration. With as many as 47 States and Puerto Rico administering the program in fiscal year 1983, it is uneconomical to maintain a separate program, with all the attendent requirements, for only three states. Additionally, one of the the three States that has decided not to administer the program in fiscal year 1983 has advised the Department it would assume the program if mandated by Congress. In another State (Hawaii), the amount of funds is so small and the number of grantees so limited, the State cannot see the necessity of assuming responsibility since each eligible unit has been funded by HUD whenever it applied.

Question: Is this consistent with the changes made in 1981 to enhance the flexibility of States in making their own decision?

Answer: The Administration's proposed legislation in 1982 would have mandated administration by the States. The flexibility is in reference to the opportunities available to the States in designing their programs in response to State and local objectives and priorities. With 48 States taking advantage of the opportunity, we see no reason to maintain a HUD program for only three States.

AUTOMATED MANAGEMENT SYSTEMS

Question: As of February 28, 1983, HUD had an inventory of 1,892 assigned multifamily projects containing about 252,000 units with an outstanding mortgage balance of approximately $3.6 billion. The cost to the Federal Government from the failure of insured projects is tremendous, particularly if HUD ultimately has to acquire and dispose of the projects.

Senator Garn—Continued

The management of this inventory is a huge task. Last month the staff reviewed your automated property management systems. Although the data contained in the system, and its instant availability, is impressive, the true test of the system will be the extent to which it reduces costs and improves your management.

I am concerned that these systems contain criteria to alert the staff to upcoming problems. What specific "flags" have you built into these systems?

Answer: The "flags" included in the Multifamily Property Management System consist of monthly reports (which can be obtained on demand) on project rent collection, rental delinquencies, budget variances, profit and loss analyses, and comparisons of vendor and expenditure lists to detect bid splitting or other suspect cost items. The design of the balance of the systems includes delinquency listings and provides for late payment penalties where applicable.

Question: What is the total expected cost and completion dates for the development of each of these systems?

Answer: There will be five automated sub-systems associated with the insurance and management of multifamily projects. The following table lists them and the actual or anticipated completion dates for the development of the systems:

Multifamily Property Management - September 1982
Multifamily Notes Servicing - September 1983
Multifamily Underwriting - January 1984
Multifamily Premium Billing - January 1984
Multifamily Claims - July 1984

Full cost data are not yet available for each system, but we have done cost/benefit comparisons on two of the systems for which sufficient data are available to develop a model. The costs/benefits based on a seven-year life cycle, for those systems are:

	Benefits/Costs (Millions)	Ratio
Multifamily Property Management	22.2/13.7	1.6
Multifamily Notes Servicing	93.8/60.6	1.5

In the case of the Multifamily Property Management System, which was acquired during September 1982, there are more specific data available. This system is currently operational in eight regions and will be in operation in all ten by early August. The one-time cost to acquire the system, under a contract which included the programs and modifications and the training of 150 to 200 property managers and staff in 20 Area Offices, was $650,000. The operational cost is about $5.00 per unit per month for the 25,000 units under management, or about $1.5 million per year.

RENTAL REHABILITATION PROGRAM

The Administration is requesting $150 million for Fiscal Year 1984 to implement a new Rental Rehabilitation Grants Program. This program would provide grants to states and units of local governments for up to one-half of the cost of rehabilitating both single-family and multifamily rental properties. An estimated 30,000 rental units would be rehabilitated under the program in Fiscal Year 1984.

Question: Will there be any limits and/or controls established on the type or amount of rehabilitation assistance allowed on a given project to ensure that only substandard units are brought up to code at the minimum cost feasible?

Answer: The proposed Rental Rehabilitation Program (RRP) has several mechanisms built into its design to ensure modest levels of rehabilitation at the minimum cost. The rehabilitation standard for the program is the Section 8 Housing Quality Standard (HQS). Unlike HUD's minimum property standard, the HQS is a modest standard designed to assure that units are "decent, safe, and sanitary." While local governments may elect to exceed this standard to conform with local codes or to achieve administrative efficiencies there are two other factors in the program which will inhibit excessive and costly repairs. Specifically, the RRP allows only 50 percent of the cost of rehabilitation to be paid with program funds. Because projects will be located in modest neighborhoods where the rents available to amortize increased debt service are limited, this serves to control unnecessary rehabilitation costs. The high visibility of the subsidy is expected to produce local pressure to use funds as cost effectively as possible.

In the CDBG financed Rental Rehabilitation Demonstration, which essentially follows the same rules as the RRP, rehabilitation costs average about $10,000 - $12,000 per unit with less than $5,000 per unit subsidy. We consider this to be an appropriate level of rehabilitation. Any nationally mandated limit may become more burdensome and wasteful than beneficial under the circumstances.

ENTERPRISE ZONES

Question: If an Enterprise Zone Act is passed, what safeguards does HUD believe are needed to limit Federal revenue losses?

Answer: The tax incentives provided under the Act will result in the loss of some Federal revenue. To limit losses to the Treasury resulting from use of Enterprise Zone tax incentives, the Administration has included "minimizing unnecessary tax losses to the Federal Government" as a major factor which must be considered in selecting nominated areas for Enterprise Zone designation. Thus, a zone gerrymandered to include an existing, profitable business could be rejected on this ground.

Question: Would program costs be offset by newly-generated revenues or reduced government expenditures, and, if so, to what extent?

Answer: Though it is difficult to estimate the net cost of Enterprise Zones, the offsetting revenues and cost reductions undoubtedly would be significant. Two areas which affect the net cost are (1) the reductions in Federal Government expenditures for welfare, AFDC, food stamps, unemployment compensation, and supporting social service programs as unemployed persons are hired in Enterprise Zones, and (2) the increased revenues from taxes paid by Enterprise Zone businesses that become more profitable and by individuals who receive new jobs and begin to once again earn an income. Offsetting revenues and cost reductions should also be realized by participating State and local governments, as previously tax-delinquent properties again become revenue producers.

Question: What is the estimated cost of an Enterprise Zone program over its expected life?

Answer: The Treasury Department has not been able to do a cost projection for the entire 24 years for which Enterprise Zones would be authorized. However, in short term, the Treasury Department has made the following gross estimates of revenue loss: in FY 1984 the revenue loss would be $87 million, since tax incentives would affect taxable years beginning after January 1, 1984; and the cost in terms of foregone revenues in FY 1985 has been estimated at $400 million, $765 million in 1986, $1,058 million in 1987, and $1,142 million in 1988. These estimates are based on the assumption that the increased business activity would have occurred in any event elsewhere. The total cost of the program increases during these years as the number of zones and the pace of activity in them increases. The estimates do not reflect costs offset by secondary and tertiary benefits which will result, such as reduction of welfare and unemployment costs, new tax revenues, enhanced local tax bases, and other economic ripple effects.

Question: Last year, I asked you about your plans to evaluate the experience of various Enterprise Zones once they are established. What is the current status of your evaluation plans?

Answer: An Enterprise Zone evaluation plan is being drafted for intra-Departmental review. The Department's strategy is to provide for short, intermediate, and long-term evaluations through at least three reports. The first report will describe the initial conditions of the Zones and the incentives offered by governments. The second report will evaluate the implementation and operation of initial Zones based on monitoring activities, local reports, and interviews with Zone participants and local officials. The third report will provide detailed analyses of induced economic activity, program costs, and indirect effects based on income tax returns, other secondary sources, and field visits.

NEW FEDERALISM INITIATIVE

Community Development Block Grants is one of the programs proposed for inclusion in the Federalism Initiative.

Question: What is the rationale for including CDBG in this initiative?

Answer: The CDBG program is one of the largest and most flexible Federal programs offering assistance at the local government level. As such, it represents an important tool needed to address the domestic problems at which the Federalism Initiative has been aimed.

The nonentitlement portion of the Community Development Block Grant program has been available to the States for administration since the beginning of fiscal year 1982. The program represents a very flexible development tool available to the States to assist small communities in meeting their community and economic development needs. Consistent with the philosophy behind the New Federalism Initiative to return decisionmaking to the lowest possible level of government, and provide maximum flexibility to those governments to best determine what needs should be met and how they should be met, the nonentitled share of the Community Development Block Grant program was a logical choice to be included among the 22 programs in the initiative.

Question: What would the effects of this proposal be on the CD program?

Answer: Under the terms of the Federalism Initiative, large cities and counties (those entitled to receive CDBG funds on a formula basis) would be able to receive their CDBG funds in a much more flexible form, if they agree to use a certain specified portion of those funds to further the CDBG program purposes. It is important to note that no entitlement community would be forced to receive their CDBG funds in this modified form. A community could elect to receive the funds under current Federal CDBG regulations for the entire 5-year period covered by the proposed Federalism legislation.

States will be free to phase-in the program along with any of the other 21 programs included in the initiative and utilize the funds to address any of the objectives of any program, based on the State and local determinations of what is the most logical way to proceed and what needs should be met. The States could, of course, decide to continue to utilize all of the Block Grant funds for the basic purposes of the Block Grant statute, and could even utilize funds from other programs for these same purposes. Since it will be a decision of the State, the actual effects cannot be determined other than the legislation will increase the flexibility and responsibility of States to chart their own course. The proposed legislation does require the States to continue to use the same amount of CDBG funds in communities of less than 20,000 as were used in those communities in fiscal year 1981.

SALARIES AND EXPENSES

Question: The FY 1984 request for Salaries and Expenses funds of $580.7 million is $12.9 million less than the current estimate for 1983. What is the nature of this decrease?

Answer: The $12.9 million reduction is the net effect of:

-- a reduction of $19.4 million for personnel costs due to a reduction of $25.4 million directly related to the decrease of 1,117 positions and 1,241 staff-years, partially offset by $4.9 million for within-grade increases and an increase of $1.1 million for the Department's full-year share of Medicare Hospital Insurance (the program was in effect for only 9 months during FY 1983); and

-- a net increase of $6.5 million for various support costs as follows:
-$0.6 million for travel;
-$0.8 million for the Federal Telecommunications System payment to GSA;
+$5.2 million for office space rental payments to GSA;
+$0.8 million for other communications and equipment rentals;
+$1.3 million for automated data processing services; and
+$0.6 million for all other expenses.

EMPLOYMENT

Question: Your 1984 request shows a reduction of 1,138 positions. Please summarize the reduction by program.

Answer: The reduction of 1,138 positions is distributed among the various activities of the Department as follows:

-- Housing decrease represents the net effect of reductions in subsidized multifamily and public housing programs and single family mortgage insurance activities partially offset by increased housing management activities......	-926
-- Solar Energy and Energy Conservation Bank reduction due to termination of the program......................	-6
-- Community Planning and Development reduction is due primarily to reduced staff activity in the areas of Small Cities Block Grants, Section 312 Rehabilitation Loans, and Section 108 Loan Guarantees.................	-15
-- Policy Development and Research reduction is due to reduced activities..................................	-5
-- Office of General Counsel reduction reflects reduced program levels......................................	-5
-- Field Legal Services reduction is consistent with reduced program levels.............................	-11
-- Office of Inspector General decrease reflects reduced program levels......................................	-9
-- Administration and Staff Services reduction is consistent with reduced program and overall staffing levels.......	-97
-- Field Administration reduction is consistent with reduced program and Field staffing levels..............	-43
-- Working Capital fund reduction is due to selected functions being performed by contractor staff in lieu of in-house staff and anticipated productivity increases..	-21
Total reductions..................................	1,138

Question: Will a reduction-in-force (RIF) be required to achieved the staff reduction proposed for 1984?

Answer: The proposed staffing reduction of 1,138--from 12,929 at the end of 1983 to 11,791 at the end of 1984--is expected to be achieved in the aggregate through attrition. However, since we have no control as to where the attrition will take place the reductions may not all occur in the targeted organizations or job series. Thus, some selective hirings and reduction-in-force (RIF) actions may be required to correct the imbalances.

Question: Have any of the positions which were abolished in the Headquarters RIF of October 1982 been refilled?

Answer: No. None of those positions have been refilled.

FIELD REORGANIZATION

Question: What were the reasons you proposed a field reorganization?

Answer: As stated in the Federal Register on February 22, 1983, the Department is restructuring its field organization and reducing its field staff in response to budget constraints, reduced workload, and program initiatives proposed by this Administration.

The key features of the reorganization plan will be to strengthen the role of the Regional Administrators, simplify organizational structure, and reduce overhead and duplication.

The major structural change will be in the consolidation of Regional and Area Offices in nine Regional cities (Boston, New York, Philadelphia, Atlanta, Chicago, Fort Worth, Kansas City, San Francisco, and Seattle). HUD's offices in Denver are currently consolidated.

This consolidation will result in lower overhead costs, including better use of available staff, elimination of redundant positions, reduced space requirements, and improved service to HUD clients.

Question: Will those changes strengthen the Regional Administrator's role?

Answer: Yes. Currently, the Regional Administrator is generally held accountable for managing regional operations, but he frequently does not have the managerial controls and flexibility necessary to be completely in charge. On many key issues, the Regional Administrator is bypassed, and Headquarters deals directly with field offices.

Under the reorganization proposal, line and administrative authority over all activities in the Region will be given to the Regional Administrator, who will become truly a line manager.

Senator Garn—Continued

The basic change is that all authority and management decision-making flows through the Regional Administrator, both up and down the chain of command. Thus, program attention, authority and accountability will be focused on the Regional Administrator.

Question: How do you expect to achieve the staff reductions associated with the proposed field reorganization?

Answer: The Department is concerned about the effect that a reduction-in-force has on its employees and has been committed to reducing staff as much as possible through attrition.

A strict hiring freeze to minimize the cost and disruption associated with a RIF was put in place on October 1, 1981.

However, it will be necessary to use RIF procedures to implement the proposed field reorganization. Based on current estimates, less than 100 employees would be separated.

Question: Will a RIF be required?

Answer: Yes, a RIF will be required.

While attrition over time will bring the Department down to its new field ceiling of 9,231, it will not eliminate the need for RIF procedures.

This is because attrition is not evenly distributed among the Department's field offices. Some offices are overstaffed based on workload, and others are experiencing skill imbalances.

Additionally, the consolidation of Regional and Area Offices in nine regional cities (Denver office is currently consolidated) will eliminate the need for a number of overhead and duplicative positions which become redundant as a result of consolidation and can be eliminated only through RIF procedures.

Question: What cost savings do you expect as a result of the proposed field reorganization?

Answer: The net savings that would result over the first two years as a result of the proposed reorganization and reduced staff is projected to be $30.8 million.

The one-time costs to reorganize and the recurring costs for the first two years of $5.3 million are offset by dollar savings resulting from the reorganization and reduced staff over the first years of $36.1 million.

Question: A recent GAO report concerning HUD's proposal to move its Nashville Multifamily Housing function to Knoxville, Tennessee, questions the validity of HUD's cost analysis for the move. Why is there such a discrepancy in the estimated cost?

Answer: The majority of the discrepancy between HUD's and GAO's estimated costs for the reorganization is related to two issues:

- The number of employees who would move from Nashville to Knoxville.

- The number of positions that would be eliminated.

Moving costs are the single highest individual expense associated with a reorganization.

The Department estimated the number of employees who would move by using historical data (50 percent). The GAO surveyed the affected employees and determined that 71 percent would move. HUD's experience shows that survey results of affected employees are not reliable indicators of behavior. The Department continues to believe that historical evidence is a more reliable indicator of the number of employees who will ultimately move to a new location.

The Department estimated that nine positions, with an average annual salary and fringe benefits of $30,000 each, would be eliminated by consolidating Multifamily functions in Knoxville. The GAO reduced that estimate by four positions because it claimed that one position would not be eliminated, only downgraded, and that increased travel requirements would necessitate three additional staff. While the particular supervisory job questioned by the GAO would be downgraded, another position is being eliminated. The GAO's claim that, because of increased travel time, three of the nine positions would have to be retained is simply not true. Both the Birmingham Office, which covers the entire State of Alabama and is 25 percent larger geographically than Tennessee, and the Denver HUD Office, which covers the entire Mountain States area (or 920 x 900 square miles), receive the same allocation of Multifamily staff per project as Tennessee. Therefore, no increase in personnel will result from any additional travel required by HUD staff in Knoxville.

Question: In light of the information contained in the GAO report, have you reevaluated your proposal to consolidate the Tennessee Multifamily housing function?

Answer: As a result of the GAO report and Senator Sasser's concerns, the Department has reassessed its rationale, reevaluated its cost/benefit analysis, and reaffirmed its intention to consolidate all Multifamily functions for the State of Tennessee in Knoxville. The Department believes that the consolidation is fully justified and cost effective.

CONGREGATE SERVICES PROGRAM

Question: Why is no additional authority being requested for Fiscal Year 1984 for the Congregate Services program?

Answer: The Administration believes that sufficient funds have been appropriated to complete the demonstration.

Question: When is an evaluation of the demonstration program anticipated to be made public?

Senator Garn--Continued

Answer: The final report is due in December 1984. The report should be issued in 1985.

Question: Although you did not request any funds for this program in Fiscal Year 1983, the Congress provided $4 million -- $500,000 of which was for a rural demonstration program. Last month, you notified us that you had determined the criteria that would be used to select sites for the rural projects. When do you expect to actually select the sites?

Answer: Sites for the rural demonstration projects are expected to be selected in September or October 1983.

Question: What are you doing with the other $3.5 million in Fiscal Year 1983?

Answer: The remaining $3.5 million will be used to continue funding those 28 Fiscal Year 1979 grantees due to terminate in 1983, providing continuation for up to two years.

Question: Please provide for the record the total number of tenants served and the cost per tenant.

Answer: In 1982, about 1,600 people received services on a daily basis, and about 300 other temporarily disabled received services for 1-3 months each. The average annual cost for Congregate Services non-housing assistance only in 1982 was about $2,500 per person.

FINANCIAL ADJUSTMENT (FAF)

Question: What have been the results of the FAF program?

Answer: The following table indicates the number of Section 8 units assisted under the FAF program in FY 1982 and in FY 1983:

	Total FAF Assistance		
	FY 1982	FY 1983 Through March 31	Total
	(Dollars in Millons)		
Units................	74,840	7,173	82,013
Contract Authority..	$103.0	$10.8	$113.8
Budget Authority....	2,398.7	321.1	2,719.8

SPECIAL ASSISTANCE FUNCTIONS -- TANDEM PROGRAMS

Question: I understand that a number of sponsors whose FHA firm commitments expired, excluding them from participation in the March Targeted Tandem opening, are upset that they were treated unfairly since other applicants appear to have obtained extensions. Could you explain the Department's policy?

Answer: The Department's policy on extensions of firm commitments was stated in Assistant Secretary Abrams' memorandum of July 14, 1982 to all HUD field offices. That memorandum authorized field offices to grant extensions of firm commitments for unassisted projects whose sponsors were awaiting a final determination on tax-exempt financing pursuant to the Mortgage Subsidy Bond Tax Act of 1980. Some field offices granted extensions of firm commitments where sponsors expressed an interest in tax-exempt financing. Those offices that extended commitments and those that chose not to grant extensions were operating within their legal authority.

The Department decided not to reinstate expired commitments due to the importance of the firm commitment date. Current processing instructions require that an approval of a reopening request must result in a reissued commitment which would carry a new date. Since selection for participation in Program 27M was conducted in chronological order of firm commitment dates, a project with a reissued firm commitment would have been placed at the end of the list and would have had virtually no chance of being selected. It was decided, therefore, that expired firm commitments, would not be reopened.

SOLAR ENERGY AND ENERGY CONSERVATION BANK

Question: What has been done to comply with the court order (Dabney, et. al. vs. Reagan) on June 30, 1982, to make the 1982 appropriation available for disbursement as quickly as possible?

Answer: To put the Bank into operation, the Board of Directors concluded at a meeting held in July 1982 that energy conservation and solar energy financial assistance could be provided most effectively by the States in conjunction with existing programs of the Departments of Energy and Health and Human Services. Therefore it was decided to implement the program by channeling the Bank's funds through State governments.

Accordingly, a Notice of Funding Availability was published in the Federal Register on August 27, 1982, inviting states to submit proposals to integrate Bank funds with ongoing state energy conservation and solar energy programs. Since it was decided to meet the most urgent needs and maximize energy conservation with the funds available, program support was limited to energy conservation and passive solar energy measures in residential dwellings for low- and moderate-income persons. In all, 48 States, 4 territories, and the District of Columbia responded with proposals by the November 15, 1982, deadline.

Tentative awards have been made to 48 States, the District of Columbia, and the Commonwealths of Puerto Rico and the Northern Mariana Islands for a total amount of $30.43 million. All of the fiscal year 1982 funds and a portion of fiscal year 1983 funds, available through March 1983, have been awarded. However, the funds cannot be obligated until the regulations take effect.

Question: Why have you decided to provide funds to only States and not cities?

Answer: Bank funds are distributed through States as providing the most effective means of achieving equality of opportunity among the entire population, rural as well as urban. Including cities as eligible recipients co-equally with States would give an advantage to urban dwellers over rural dwellers. On the other hand, at State discretion, cities may function as part of the State plan. Since the regulations permit cities to participate in the program through applications made by their States, there is no need to allow cities to apply directly to the Bank for assistance.

Question: What is the status of the regulations?

Answer: The Department submitted revised regulations to the Congress on April 11, 1983, along with a letter explaining the Department's position with reference to changes requested by Congress to the earlier draft submitted in November 1982. The House recently granted a waiver allowing the regulations to be effective upon publication. Upon receipt of a similar Senate waiver, the effective regulations will be published.

Question: When does the Department expect the funds to be available to home owners?

Answer: A cooperative agreement is being negotiated between HUD and each State stipulating the manner that the Bank's program will be implemented in each State upon publication of regulations. A number of States have indicated that they will be ready to implement the program as soon as the regulations are in place and the cooperative agreement has been executed. Assuming this occurs in late May, funds should be released for individual application by the end of June.

Question: Why have you requested transfer of the $11 million to HHS?

Answer: The HHS Low-Income Home Energy Assistance program permits a portion of its funds to be used for the provision of energy conservation assistance. In our view the most important value of the Bank's program is residential energy conservation in the form of weatherization of homes of low-income persons. Since the HHS program has closer contact with this problem and there is fragmentation of responsibility by having two or more similar Federal programs, the Department believes the maximum effectiveness in energy conservation can be achieved by concentrating the Federal effort in the HHS program.

Question: Why haven't you requested funds for 1984?

Answer: It is the Administration's position that there are already sufficient Federal and State programs to serve the energy conservation and solar energy needs of the nation through DOE and HHS programs and Federal and State tax credits and therefore, the Bank is unnecessary.

Senator Garn—Continued

CDBG NEW HOUSING CONSTRUCTION PROPOSAL

This year you are proposing that new housing construction be an eligible activity under CD.

Question: Why is new construction being proposed as an eligible activity at this time?

Answer: The Administration is committed to the principle of providing maximum flexibility to local governments in their usage of Federal funds. Additionally, some CDBG recipients have complained that they have been unable to address locally severe housing shortages. Regional differences in construction costs and the nature of the housing stock could make it cheaper and quicker for some locations to provide new construction as opposed to substantial rehabilitation. Allowing CDBG recipients to use some of these funds for newly constructed housing is consistent with the Administration's federalism objectives and should help make the CDBG program more responsive to locally perceived needs.

Question: How much would you expect to be used for new construction during FY 84?

Answer: It is difficult to predict the response of a large number of diverse grantees if our proposal to add new housing construction as an eligible CDBG activity is adopted. Overall, we do not anticipate, at least in the near future, any dramatic shifts nationally to the use of new construction from other eligible activities. Our experience with the changes in eligible activities in the 1977 Amendments and the 1981 Amendments resulted in only gradual and limited shifts in program emphasis. This reflects the fact that grantees tend to move cautiously in redirecting their program from activities that have long standing support and acceptance.

Question: Why are additional funds not requested to support the addition of this activity?

Answer: Since we do not expect a large amount of funds to be used for this purpose, at least over the first few years, an increase in overall funding is not considered to be necessary.

Question: From what other eligible CD activities are these funds most likely to come from?

Answer: We have no basis for knowing which other CDBG activities would be reduced in order to make funds available for new construction. However, it seems likely that communities that have been trying to meet severe housing shortages through CDBG assisted rehabilitation would divert some funds from that activity in favor of supporting some new construction. This is particularly so for those communities where regional differences in construction costs and the nature of the housing stock make it less expensive and more expedient to construct new houses as opposed to substantially rehabilitating existing houses.

Question: How much of the FY 84 CD funds will be needed to implement your newly proposed Indian housing program?

Answer: The CDBG proposal for Indians is to increase the funding level by $44 million to a total of $75 million in fiscal year 1984. Consistent with the overall proposal for all CDBG applicants, new housing construction would be an eligible activity in the Indian CDBG program. The use of the $75 million in CDBG funds will be at the discretion of the Tribes. They may use all or none of the funds for housing. However, based on past experience, we would expect Indian grantees to continue to use approximately one-third of the funds for housing activities as they have over the past five years.

The Department is also proposing an Indian Housing Grants program, to be administered by the Office of Housing, at a funding level of $76 million. All of these funds will be used for housing and related infrastructure activities. The $76 million for the Indian Housing Grants program is not part of the CD appropriation.

FORECLOSURES

In a January 16, 1980 GAO report, it was disclosed that foreclosures of HUD Multifamily Mortgages were taking an average of over 2 1/2 years to accomplish. Delays were being encountered at various stages, including HUD's Office of General Counsel and at the Department of Justice. HUD and the Department of Justice have taken several steps to improve the foreclosure process, including the development of a manual foreclosure tracking system and the development of a model legal instrument for use by the Department of Justice. We also questioned you about this issue at last year's hearing.

Question: To what extent has HUD improved the timeliness of the foreclosure process?

Answer: The Office of General Counsel (OGC) has developed a computerized foreclosure tracking system to assist in monitoring the foreclosure pipeline. Both OGC and Housing use output reports from the system as management tools to monitor the activities of HUD, the Department of Justice (Assistant US Attorneys) and the courts as a case moves through the foreclosure process. If a case has remained in any phase longer than it should, the appropriate entity can be contacted for an explanation.

Even though the system is considered fully implemented, it is still in its infancy and the process of entering new data and purifying those data is a slow one. In addition, data about each case are forwarded by the Area and Regional Counsel staffs to Washington to be entered into the system. This additional lag time causes further delays in the foreclosure process.

The attorneys in HUD's General Counsel's office have developed form pleadings which will help in expediting the filing of judicial foreclosure cases. OGC has also reached an agreement with the Department of Justice whereby foreclosure cases will be forwarded directly from HUD to the U.S. Attorneys without having to be reviewed by the Justice Department in Washington. Justice has also instructed the U.S. Attorneys to make more use of HUD attorneys to handle the foreclosures cases in court.

On November 15, 1982, the Department published proposed regulations to implement the Multifamily Foreclosure Act of 1981. There was a sixty-day comment period on the proposed rules. We have now reviewed all the comments and made certain changes in the proposed rule. The final rule has been drafted and is in the final stages of clearance. We anticipate that the regulations implementing the Act will be operational by the end of the Summer 1983.

Question: Can HUD provide statistics to show improvement?

Answer: We have no hard statistics at this time to show how significantly the foreclosure processing time has improved. However, the elimination of the need for the Justice Department in Washington to process cases has reduced the time by up to six months. In addition, HUD has adopted a new policy wherein we will not place a "hold" on the foreclosure while reinstatement negotiations are taking place. If an acceptable reinstatement plan is submitted, then a "hold" will be effected and eventually the case will be withdrawn. This discourages mortgagors from employing tactics merely to "buy time".

Question: Do you have an estimate of the losses that might be reduced as a result of shortening the foreclosure process?

Answer: No direct losses to the Department can be quantified. However, in many cases, an owner will cease to make mortgage payments as well as cease to perform even minimal maintenance. Therefore, the longer the foreclosure process takes, the more the property depreciates causing its market value to decrease. This causes HUD to realize a lower sale price at the foreclosure sale. Should HUD become the mortgagee in possession, or later acquire the project, any deferred maintenance expenses must come out of the project's operating income, thereby reducing available income to pay debt service.

CDBG

Question: What results/problems have been experienced with State administration of the non-entitlement (small cities) program?

Answer: Considering this was the first year of the program, it has been remarkably free of problems given that 36 States plus Puerto Rico assumed the program in fiscal year 82; GAO's seven States' study of the transfer would appear to bear this out. In testimony prepared for the Senate Subcommittee on Housing and Urban Affairs, GAO reported that "The States we visited are making good progress in taking over the administration of the program and their actions to date are consistent with the 1981 changes." Some problems relating to Federal requirements have surfaced here and there, but in most cases we have been able to work out these problems with the States. Results indicate the States have been able to design programs that are responsive to the needs of their small cities and, at the same time, reduce the application burden. States received more applications than HUD did in 1982, and have funded more communities. The States have also been able to target funds to the smaller, less sophisticated communities as well. We have also seen a shift in the types of activities funded, indicating the ability of the States to truly address local priorities, such as water and sewer needs. Also there was a substantial increase during 1983 in the amount of CDBG funds being used for economic development as a result of the State program. Most impressive, however, was the effort by States to involve local officials in the design of the programs. Efforts of the States in this area far exceed the statutory requirement. The Department's Annual Report to the Congress on CDBG contains some specific results of the State transfer. The GAO testimony referred to before also points out more results of the State's efforts.

Question: What impact does the 1980 Census data have on the existing CDBG formula allocations and why are major revisions to the entitlement formula not being proposed?

Answer: The Department's report entitled "Effects of the 1980 Census on Community Development Funding" covers this subject in considerable depth. The report was delivered to the Chairmen of both the authorizing and appropriations committees on May 11, 1983. As noted in the report, while the use of 1980 Census housing factors in the formula causes a slight reduction in the formula's responsiveness to community needs, it continues to be highly responsive to need. The Department believes, under these circumstances, that no change in the allocation formula is needed.

Question: What is the impact of the "Jobs Bill" on the CDBG program?

Answer: The "Jobs Bill" will provide a substantial amount of additional funds in 1983 for each CDBG entitlement community. The amount of increase each will receive is influenced by the relative amount of unemployment in the State in which the community resides. The amount of "Jobs Bill" funds going to each community ranges from about 20 percent to over 60 percent, but averages around 40 percent of their entitlement share of regular CDBG funds. For nonentitlement communities, the amount of funds available is proportionately smaller but still quite significant. The average State will receive an increase of about 21 percent.

It is expected that entitlement communities and States will have little trouble in using the additional "Jobs Bill" funds in a timely manner. There are always more applicants for nonentitled CDBG funds than there are funds themselves. Moreover, most entitlement communities had developed a capacity for programming larger amounts of CDBG funds prior to the cutback in the 1981 and subsequent years' program fund levels.

Question: Does the Department intend to fully utilize the CDBG funds for Indian Tribes as recommended in the Conference Report -- especially the directive to use the remaining authority up to the $60 million CD limitation for Indians?

Answer: On page twelve of the Conference Report accompanying H.R. 1718 ("Jobs Bill"), which was subsequently enacted as P.L. 98-8, the conferees urged the Department to make available from existing funds, the entire $60,000,000 authorized for the Secretary's Discretionary Fund in 1983. The conferees indicated that the additional amount ($3.5 million) was to be used for Community Development Grants to Indian Tribes.

After carefully considering the language contained in the Conference Report, the Department finds no practical way to implement this recommendation. For the Department to add $3.5 million from the 1983 CDBG appropriation to the Secretary's Discretionary Fund, we would be forced to recover funds from both the entitlement and nonentitlement programs in order to maintain the statutory 70/30 split. All of these funds have been assigned to our Field Offices pending statement submissions from grantees. Also grantees have been advised what funds they may receive from the 1983 appropriation. Since some of these funds have already been obligated, administrative actions to deobligate (recapture) these funds would have to occur. Therefore, we are of the opinion that it would be administratively infeasible to recapture from entitlement and nonentitlement (States and Small Cities) grantees an amount sufficient to cover the $3.5 million balance.

HOUSING FOR THE ELDERLY AND HANDICAPPED

Question: Please provide a table showing the number of units Congress appropriated Section 202 funds for, the number of units reserved, the number actually constructed, and the corresponding per unit costs for FY 1979 to FY 1983?

Answer: The following table provides the requested information:

	FY 1979	FY 1980	FY 1981	FY 1982	FY 1983
Appropriations	25,000	19,700	18,800	17,200	14,000
Reservations	22,525	18,720	15,166	16,038	NA
Completions a/	9,320	16,418	27,968	24,072	NA
Per unit cost (gross) ..	$34,287	$38,267	$42,774	$41,990	NA

a/ Cannot be tracked to source year of funding, represents completions in year.

NA - Not Available

Question: Why aren't you recommending that the elderly and handicapped needs be met through a certificate program rather than new construction?

Answer: The elderly or handicapped population are eligible under the certificate program. However, they must seek their own existing units and these units may not meet their particular needs such as barrier free access. The Section 202 program would guarantee that these needs are met.

Question: What percent of the Section 202/8 program units are being utilized for the handicapped?

Answer: Over the past several years, approximately 10 percent of the unit reservations have been for the handicapped.

Question: Please describe the pros and cons of competitive bidding on Section 202 construction projects.

Answer: The central reason for the use of competitive bidding in Section 202 project development is cost containment. Competitive bidding is used throughout the Federal government as the standard and best method for obtaining the lowest and best price on construction projects. Competition among sponsors for reservation funding does not bring about competitive pricing of construction.

Quality control and assurance of proper project completion will be guaranteed by requiring contractors to furnish 100% performance and payment bonds.

Competitive bidding will be necessary only when mortgage amounts exceed $1 million or when rents exceed Fair Market Rents. Therefore, if cost benefits truly exist in the development team approach, they should be manifested by rents which don't exceed FMR's, thereby precluding the need for competitive bidding.

Design is a function of the architect, and only competent architects should be used on Section 202 projects. Architects planning projects can work with sponsor's consultants or HUD Field Office design representatives, rather than with contractors. These design representatives are knowledgeable and can advise architects concerning cost-containing measures, in order to produce efficient designs. During the bidding period, there will be opportunities for many contractors to review the plans and point out errors or omissions in them. Any errors and omissions can be corrected by addendum, and contractors' suggestions can also be included.

Since non-profit sponsors (or developers) sometimes lack the sophistication of profit-motivated developers and their resources, the purpose of the grants and loans is to provide them with the resources needed in the early stages of processing, and the wherewithal to obtain the help of experts.

The project will be advertised so that competitive bids can be taken from contractors for the construction of the project.

The corporation formed by the non-profit sponsors for the express purpose of building the project--the borrower--currently preselects the construction contractor. Frequently the basis for this selection is arbitrary. In any event, with preselection, the forces of competition often do not come into play. During the processing there is little incentive to hold down construction costs, and a positive incentive to increase costs to the maximum allowable.

If costs are contained within $1,000,000 or within the Fair Market Rent limits, there will be no requirement for competitive bidding, and borrowers can choose their own contractor. If costs exceed these limits, open competitive bidding will take place to ensure that the project will be built at the lowest allowable cost.

Question: What are your estimates of the potential cost savings associated with competitive bidding?

Answer: Competitive bidding would be required only if the total costs exceed $1 million or the rents would exceed the Fair Market Rents. These two criteria are expected to reduce construction costs by up to 10 percent.

RENTAL REHABILITATION GRANTS

For the second year, the Department is proposing a Rental Rehabilitation Grants Program.

Question: Since housing rehabilitation is a popular activity under the CDBG Program, why not add $150 million to the CDBG request rather than begin a new categorical program?

Answer: The Rental Rehabilitation proposal is not a categorical program in the traditional sense. Rather, it is consistent with this Administration's philosophy of maximizing local discretion while minimizing federal involvement in local decision making and program implementation. Localities would design their own subsidy mechanism, select neighborhoods, types of properties and owners, and establish relationships with private lending institutions and residents.

Under the CDBG program, communities have the discretion of applying their funds for rehabilitation of housing. However, the communities are not required to use these funds for housing rehabilitation and the units which are rehabilitated are not necessarily restricted to assist the communities' very-low income residents. The Rental Rehabilitation Grants program is only to rehabilitate structures for rental to the most-needy families in an area and the program is specifically designed to complement the Department's "affordability strategy" in conjunction with the Section 8 Housing Payment Certificate initiative. Also, units rehabilitated with Rental Rehabilitation Grants must meet or exceed HUD's Housing Quality Standards.

Moreover, private sector participation with CDBG recipients in the provision of rehabilitated units is not required. A key feature of Rental Rehabilitation Grants is a reliance on private market forces to encourage owner participation and availability of rehabilitated units.

Question: How does the Department plan to distribute funds for this program?

Answer: Under the Administration's proposal, a number of cities with populations of 50,000 or more, as well as urban counties qualified for the Community Development Block Grant program, will receive direct formula allocations of Rental Rehabilitation Grant funds. The remainder of program monies will be distributed on a State-by-State basis, with the program to be operated by State governments or, if States are not interested, by HUD Field Offices. HUD will establish minimum amounts for the direct formula allocations to cities and counties. At a program level of $150 million and a proposed minimum allocation of $100,000 to any city or urban county, it is anticipated that 200-220 cities and 30-40 urban counties will qualify for their own allocations.

Question: Since the rental rates for these 30,000 units are based largely on prevailing rental rates, how will lower income individuals be able to afford these units under your certificate payment program?

Answer: The legislation is designed to rehabilitate rental housing in neighborhoods where low- and moderate-income families live. These are areas where rents are low, and generally will continue to be low for some years, because that is all the market place can command for units in the area. Specifically, the program will operate in neighborhoods where market rents for units after rehabilitation are at or below the Section 8 FMRs. It is proposed that up to 30,000 eligible families (those with incomes at or below the 80th percentile of median income) will receive Section 8 Housing Payment Certificates to assist them in affording the after rehabilitation rents.

Evidence already exists that low-income tenants will be served by this program. In the CDBG Rental Rehabilitation Demonstration, in which we are experimenting with the approach of the Administration's proposed program, low-income tenants are benefitting. Our latest analysis indicates that of our sample of 169 units which are occupied and for which we have tenant income data, 141 or 83 percent of these units are occupied by tenants with incomes at or below 80 percent median income. Moreover, out of a sample of 215 units where the units are occupied and the rents are known, 89 percent have rents within the Section 8 Existing FMRs.

Question: Using New York or any other high-cost area, please estimate what an average tenant's monthly payment would be above and beyond the $1,916 provided through the certificate program.

Answer: The $1,916 average subsidy amount under the Housing Payment Certificate program is a national average based upon the difference between an estimated Payment Standard and 30 percent of adjusted tenant income. In a high-cost area such as New York City, the estimated Payment Standard would be $4,328. Assuming that the tenant has an adjusted annual income of $4,842 and rents a unit at the Payment Standard, the subsidy amount would be $2,875 and the tenant's rental payment would be $1,453. The tenant's rent payment is not only a function of income but it is also a function of the rent charged for the unit chosen. According to the terms of the proposal put forward by the Department, any rent charges over and above the Payment Standard would be paid by the tenant and, conversely, any savings accruing as a result of renting a unit priced below the Payment Standard would belong to the tenant.

Senator Garn—Continued

URBAN HOMESTEADING

Question: Are any changes proposed for the program in 1984?

. Answer: HUD proposed the multifamily homesteading demonstration program and an amendment to allow HUD and the localities participating in the program to charge a consideration for the transfer of properties to the localities and to the ultimate owner-occupants.

Question: What will the Department do if the multifamily legislation is not enacted?

Answer: HUD will administer the single family homesteading program at the higher funding level, possibly accepting 10 to 20 new communities into participation.

Question: What are the reasons that the Department is not using the VA or FmHA properties in the Urban Homesteading Program?

Answer: Veterans Administration and FmHA properties are normally the higher valued properties in the Urban Homesteading program, usually exceeding the $15,000 limit contained in the Regulations. Previously, this limitation had the effect of virtually precluding these properties from being used in the program. A provision for waiver of the $15,000 ceiling, already in effect for HUD/FHA properties, was extended to VA and FmHA on September 20, 1982.

Program data indicates that 10 FmHA and 60 VA properties were transferred during fiscal year 1982. The majority of these transfers occurred after the waiver provision went into effect.

The transfer of VA and FmHA properties should accelerate in fiscal year 1983.

TERMINATION OF COMMUNITY PLANNING AND DEVELOPMENT PROGRAMS

Question: Why does the Administration propose to terminate the Section 108 Loan Guarantee Program?

Answer: The Administration believes Section 108 is not essential since recipients can always utilize CDBG funds for activities that are currently being financed under Section 108. In addition, the termination of the Section 108 program will help to alleviate pressures on the credit markets and help facilitate economic recovery.

Question: Why is the Section 312 Rehabilitation Loan Program proposed for termination?

Answer: Single family rehabilitation activities undertaken with Section 312 funds can be accomplished more efficiently and with greater discretion by localities with Community Development Block Grant funds. Similarly, rental rehabilitation activities can more effectively be completed with the proposed Rental Rehabilitation

Grants program. Both programs, the Community Development Block Grant and Rental Rehabilitation Grants programs permit substantially greater decision-making flexibility by localities. For example, they make it possible for communities to develop programs under which private financial institutions may perform basic underwriting functions and undertake some or all of the risks associated with the possible default on a rehabilitation loan.

Question: How many loans would be available through each program if they were maintained at the FY 1983 levels, with the 312 program continued as a revolving fund?

Answer: Based on prior experience, we estimate that 55 Section 108 Loan Guarantee commitments could be made at our FY 1983 level of $225 million.

Of $84.1 million estimated to be available for the Section 312 Program in Fiscal Year 1983, we have allocated $16,820,000 for single family properties in support of Urban Homesteading programs, and $67,280,000 for multifamily properties. With these funds, we anticipate making approximately 900 single family loans averaging about $19,000 each and about 420 multifamily loans averaging $160,000 each.

Assuming the same level of funding and average loan amounts in FY 1984, it would be possible to make approximately 4,426 single family loans, if the program was limited to single family loans, or 526 multifamily loans, if no single family loans were permitted. If the available funds were allocated for both single family and multifamily loans, a mix similar to the 1983 allocation would result.

INELIGIBLE HOUSEHOLDS

Question: What steps has HUD taken to bring projects such as those identified by the Management Information System (MIS) in the Chicago Area Office, into compliance with 10 and 20 percent limitation on ineligible household occupancy of Section 8 units?

Answer: The question raised refers to renting Section 8 units to market-rate tenants. There are a number of "controls" relating to the number of units to be occupied by Section 8 assisted and, conversely, non-Section 8 assisted tenants. First of all, the number of units set aside in a project for Section 8 occupancy is defined under the Housing Assistance Payments (HAP) contract; market-rate tenants are limited to 20 percent occupancy in older projects, and to 10 percent in more recently completed projects. Provisions of the HAP contract (and Section 8 regulations) provide that for failure to stay within the percentage limitations HUD may reduce the number of units under the original contracts and/or may take legal action against the owner. We are also examining options for recapturing such under-utilized units and shifting them to other projects where demand is greater and occupancy policy is more in line with program guidelines. Project owners are required by regulation to take all reasonable steps to find income eligible tenants for project units.

Senator Garn—Continued

Question: The December 1982 MIS report indicates that there has been no reduction in the number of Section 8 projects which are exceeding the limitations on ineligible households occupying Section 8 units. What action will HUD take to make available to assisted household units already under Section 8 contract but presently occupied by ineligible households?

Answer: HUD is working with PHAs and project owners to develop more effective outreach to eligible tenants. As ineligible tenants leave units, they are being replaced by eligible ones.

PARTIALLY ASSISTED HOUSING

Question: Did the withdrawal of preference to partially-assisted Tandem projects result in procedural changes in project selection, and if so, has it had any impact?

Answer: The withdrawal of preference for partially-assisted/ Tandem projects for selection under the Section 8 Housing Assistance Payments program was included in regulations published in the Federal Register as a Final Rule on November 30, 1982 and did result in procedural changes in the project selection process. These final regulations included changes in the ranking of projects for selection under the Section 8 program in keeping with the withdrawal of preference provision. However, the Department has not given preferential consideration to partially-assisted Tandem projects since October 1, 1981, the effective date of the statutory amendment. No information is readily available with which to ascertain the impact of the regulation.

Question: What is HUD's estimate of the number of Tandem-financed units which have been occupied by unassisted households under both the Section 8 and the targeted Tandem programs?

Answer: Since the inception of the programs, a total of 2,742 projects representing 290,378 units have been provided commitments under the Section 8 (Program 25) and Targeted Tandem (Program 27) programs.

This total includes 2,185 projects and 211,690 units assisted with Section 8 contracts and 557 projects and 78,688 units under the Targeted Tandem program. All of the projects and units assisted under Targeted Tandem are characterized as unsubsidized since these projects do not have Section 8 rent subsidy contracts. No information is readily available on the total number of unsubsidized units included in Section 8 projects financed under the Tandem program.

TAX EXEMPT FINANCING

Question: What would the increased receipts be if State Housing Finance Agencies used taxable rather than tax-exempt bonds?

Answer: HUD estimates that over $14 billion of tax-exempt mortgage revenue bonds were issued by State Agencies in calendar year 1982 for both single family and multifamily purposes. There is no single accepted method for measuring lost Federal revenue associated with these bonds. At least three different attempts to measure this cost have been made by the General Accounting Office, the Joint Committee on Taxation and the University of Chicago. Each of these studies used different assumptions as to what items to include in the cost saving computation including tax brackets of bond holders, depreciation allowances and other contributing factors. The table below shows the range of estimated revenue loss determined by these three studies.

	Estimated Revenue Loss per $1 Billion of Mortgage Revenue Bonds
General Accounting Office	$31.5 Million
Joint Committee on Taxation	22.7 Million
University of Chicago	7.5 Million

Applying these results to the volume of activity in calendar 1982 leads to a range of estimated revenue loss of between $105 million to $441 million.

Question: If new production programs are largely terminated, will the Department continue to use Section 11(b) authority to permit tax-exempt financing by local Public Housing Agencies?

Answer: The FY 1984 Budget requests no funding for the production of New Section 8 units (except for the Section 202 Elderly Program). Therefore, Section 11(b) authority will not be utilized in the future unless this program is revived.

Question: What would the increased receipts be if Section 11(b) tax-exempt financing was eliminated?

Answer: As stated above, no additional production is planned utilizing tax-exempt financing under Section 11(b) authority. Therefore, it is not possible to estimate the increased receipts that would occur from elimination of the use of this authority.

STATE AGENCIES

Question: Why are non-insured State assisted projects excluded from conversion of Rent Supplement and RAP to Section 8?

Answer: Rent Supplement and RAP units which require additional subsidy funds can be assisted in one of two ways: conversion to Section 8 or amendment through the use of recaptured Rent Supplement or RAP authority. Because the Section 8 program has a built-in mechanism for funding future rent increases, the Department has consistently argued that this alternative provides the best solution for the long-term needs of these projects. However, State agencies have opposed the conversion of their projects to Section 8 because the subsidy contract term is shorter than their outstanding bond issues and they have insisted on the security offered by the longer term Rent Supplement or RAP contracts.

Senator Garn—Continued

Thus, one of the principal reasons why State agency projects have been excluded from conversion to Section 8 is that they do not want to be converted. The policy change that the Department made this year was to announce that the State projects would not be offered assistance under either option: conversion or amendment through the use of recaptures.

More importantly, we believe that State agencies should properly share in the responsiblity for financing the cost of their projects. The agencies were given substantial discretion in selecting these projects, supervising construction and their day-to-day management. It simply does not make sense to give one level of government the effective control over how a program is administered while another level is required to cover the costs.

HUD will still honor its contractual obligations for all projects. The State agencies are only being asked to pick up the cost of any subsidy increases above the amount agreed to in the contract. We believe that this will provide a better incentive to hold down rent increases and control costs in the future for these projects.

Question: What would it take to provide sufficient amendment funds to take care of the approximately 33,000 State units assuming 5% cost increases, 5% annual tenant income increases and a 10% State share?

Answer: The Department has recently estimated the need for amendments over the remaining contract terms under the above assumptions as follows:

	RENT SUPPLEMENT	SECTION 236 RAP	TOTAL
	(Dollars in Thousands)		
HUD Share:			
Contract authority ..	$50,828	$63,365	$114,193
Budget authority	653,103	814,202	1,467,305
State Agency Share:			
Contract authority ..	5,647	7,041	12,688
Budget authority	72,567	90,467	163,034

HOUSING PAYMENTS CERTIFICATES

Question: You propose moving from the 50th to 40th percentile as well as from recent movers to all standard unit rents minus new construction rents. What is the cost effect of each of these changes in the formula?

Answer: The impact on the average reservation amount under the Housing Payment Certificate program of moving from the 40th to the 50th percentile and from all standard units (less recently completed units) to recent movers is summarized on the table below:

Housing Payment Certificate reservation amount (1984 Budget)	$1,916
Impact of:	
Increasing the Payment Standard base from the 40th to the 50th percentile	+275
Changing the base from all standard units to recent movers	+275
Revised reservation amount	2,466

Question: How many people in this country technically qualify to receive subsidy assistance?

Answer: There are approximately 9 million families and elderly individuals (not counting single-person nonelderly households) who are very low-income renters eligible to receive assistance.

Question: What proportion of the need do you meet with your proposals?

Answer: By Fiscal Year 1984 it is estimated that the universe of eligibles will increase to 10.3 million persons. It is further estimated that approximately 30 percent of those very low-income renters will be receiving assistance under the Public Housing, Section 8, Section 236 and Rent Supplement Programs.

Question: How will the certificate program work in rural areas?

Answer: Completed research indicates that the Section 8 Existing Housing Program has worked well in rural areas. The certificate program should be equally successful. One of the factors contributing to success of the Section 8 Existing Housing program in rural areas has been the active participation of numerous State agencies, including state housing finance agencies and also State departments of economic and community affairs.

In a sense, the certificate program is more suited for delivery of assistance in rural areas than the development programs. Construction of housing often requires a minimum feasible project size that is too large for development in small towns. Since the certificate program is oriented towards individual families, not projects, this problem does not arise.

Question: The proposed Housing Payment Certificate is to include a portability component. Can you explain how this will operate?

Answer: If a family with HPC assistance moves from, say, Chicago to Houston, our current thinking is that the PHA in Houston would issue a new certificate to the family, to be covered by a new allocation. The original PHA would not reissue the family's former certificate until a unit was rented in the new location. However, final decisions on how this would be administered have not been made.

We expect that the number of interstate moves will be quite small. However, we can expect moves across jurisdictional lines within metropolitan areas to be substantial; in Massachusetts, a study of 1,693 recipients in a regional Section 8 Existing program showed 17 percent had moved from one municipality to another. In the EHAP demand experiment, Pittsburgh and Phoenix ran regional programs and found that among movers initially living in the central city, 18 percent in Pittsburgh and 33 percent in Phoenix moved to the suburbs.

INDIAN HOUSING

Question: Please describe your new Indian housing program.

Answer: The Administration's Fiscal Year 1984 Budget submitted to Congress in January 1983 contained two approaches proposed by HUD for delivering Indian housing. The initiative requires total budget authority of $151 million and is intended to fund new homes, the water and sewer facilities for these homes, and community development activities. These proposed new approaches assume that the tribe would administer the program and could, if it desired, delegate its responsibilities to the local Indian Housing Authority (IHA).

The new Indian housing program would involve a combination of grants to write down mortgage costs and to fund water and sewer facilities, modified FHA mortgage insurance and, for very low income Indian families, the housing payments certificates program would be tied to the new units for a 15-year term. A total of $76 million in budget authority would be authorized to facilitate the construction of about 1,500 homes for families needing housing assistance in Indian areas. Although the specific use to which available authority would be directed will be a prerogative of the tribes, it is estimated that $38 million would be used for housing grants, including related infrastructure, and $38 million for the certificates. The program has the following features:

-- Use of private investment, generally insured under FHA, for the newly constructed unit in order to leverage the use of limited Federal funds.

   We have conducted an informal survey of national and regional mortgage bankers who service geographic areas in which Indian tribes are located. The mortgage bankers do a large portion of their business with FHA and VA. All mortgage banking firms contacted have expressed a positive interest in participating in this proposed Indian housing program.

-- Originating FHA single-family loans with representatives of local depository banks, subject to implementation of our new direct endorsement procedure and acceptance of FNMA contract documents in general use by them.

-- Provision of Federal assistance for a "write down" of mortgage costs and infrastructure support as well as certificates to make housing affordable for low and moderate income families in Indian areas.

-- Adaption of the FHA and certificate programs, housing tools which were previously unavailable in Indian areas.

Senator Garn—Continued

-- Our legislative proposal provided that eligible tribes would develop their own program taking into account reasonable development costs for the area as well as family income. The following limits would apply: Grant funds could be used to pay 100 percent of all water and sewer facilities costs and they could write down up to 70 percent of the reasonable development costs or down to $15,000.

-- HUD is also proposing legislation to expand the Community Development Block Grant Program to make new construction an eligible activity for all eligible recipients, including Indian tribes. The Indian community development funding would be increased from $31 million for FY 1983 to $75 million for FY 1984. The large number of substandard houses on the reservations will afford the tribes the opportunities to maximize the use of the additional funds through rehabilitation, e.g., 13,000 units are substandard due to lack of complete plumbing.

Question: Why are you proposing a new program for Indian Housing?

Answer: The new program is being proposed because it is the goal of this Administration to produce the maximum number of new units annually without excessive budget authority; to assure that the new housing produced can be affordable by those in need; to bring private sector involvement into the program; and to provide the tribes with greater flexibility to administer their housing programs without unnecessary Federal controls.

The Department believes the previous decisions to bring "Big City Type Public Housing" programs to the reservations was a misjudgment from the stand-point of requirements perpetrated upon the Indian tribes. Therefore, we are proposing to terminate funding for new housing under the current Indian housing program after FY 1983 and provide needed housing under the new proposals discussed. However, we did not abandon our commitment to allocate the 2,000 units appropriated in FY 1983 by Congress nor are we abandoning our commitment to complete units in the pipeline.

Question: How many years would it take to produce 50,000 homes under the current rate of funding in your FY 84 Budget?

Answer: The total funding level in the current FY 1984 Budget is sufficient to build between 1,500 and 3,265 homes, depending on the decisions reached by the tribes with respect to the uses to which available Indian Housing and CDBG funds could be applied. If 1,500 units are produced annually, it would take about 33 years to produce 50,000 units. If 3,265 units are produced annually, it would take about 15 years to produce 50,000 units.

HOUSING FOR THE HOMELESS

Question: What plans, if any, does the Department have to provide assistance to the growing number of homeless individuals?

Answer: First, communities wishing to operate emergency shelters for the homeless can do so using the Community Development Block Grant Program (CDBG). While construction of shelter is permitted only in limited cases, the acquisition and/or rehabilitation of real property for use as a shelter for the homeless is an eligible use of funds. Buildings currently vacant, such as surplus schools, could be acquired and remodeled; buildings currently in use as a shelter could be improved to meet growing demand.

The operating costs, including funds for equipment, supplies, utilities and staff, are all eligible public service activities under the Block Grant program. HUD Regional Administrators have been instructed to approve an earlier start for the fiscal year 1983 CDBG program in cases where grantees do not have funds available to undertake activities to aid the homeless.

Second, HUD has taken steps to make available specified HUD-owned single-family properties for use by the homeless. HUD Regional Administrators have been authorized to approve the leasing of specific homes in the HUD-acquired inventory. Arrangements for the leasing to the homeless would be made through local officials or local charitable organizations.

Third, Public Housing Authorities (PHAs) may house the homeless ahead of other eligible households under their "emergency" priority admission category. If a PHA does not have this classification in its admission policy, but would like to add it in order to house the homeless, the HUD Area Office can work with the PHA to make the required changes.

ASSET SALES

Your budget estimates the sale of almost $2.7 billion in Tandem loans in 1983.

Question: What has the sales experience been to date?

Answer: As of May 18, 1983, the Government National Mortgage Association has sold approximately $1.98 billion in Tandem loans during FY 1983.

Last year, there was quite a furor as a result of the prepayment on a Section 202 loan and the owners' plan to sell the structure for condominium conversion.

Question: Are similar problems likely to occur if you sell Section 202 loans?

Answer: The loan referred to in your question was made pursuant to the "old" Section 202 program. Under this program a loan cannot be prepaid without the Secretary's written consent. The mortgages we are planning to sell, however, were made under the "new" Section 202 program, i.e., the program authorized by the Housing and Community Development Act of 1974. The mortgage note contains no prohibition against prepayment of the loan, nor is there any requirement that the Secretary approve a prepayment. Therefore, the project owner is free to prepay the loan at anytime whether HUD or a HUD-approved mortgagee is holding the loan.

We have, however, built in a safeguard to assure that project owners who buy the mortgages on their projects from HUD do not change the use of their projects. Project mortgagors who purchase the mortgage on their projects will be required, at sales closing, to execute a Declaration of Covenants, Conditions and Restrictions. This document shall bind the current owners and all of their successors and assigns to continue to operate the project for elderly or handicapped families for the duration of the Section 8 HAP contract. In addition, only those projects with 20 year Section 8 contracts will have their loans offerred in the planned auction.

The first sale of Section 202 loans was originally scheduled for May 25, 1983. However, based upon concerns expressed by certain members of the Congress concerning the sales and limited market interest in the offering as structured, this sale has been postponed. The Department currently is reexamining the proposed sales mechanism for the purpose of incorporating changes which will address the concerns expressed by the Congress and the investment community.

Question: What benefits, if any, does the Department expect to accrue through the current policy of selling these assets?

Answer: Sale of the mortgages will raise funds for the Treasury. These funds will help off-set the federal deficit and will reduce HUD's borrowing needs and costs HUD would otherwise have incurred in borrowing the funds to support the program. Additionally, since HUD will no longer need to perform accounting or servicing functions on the loans sold, the mortgage sale program also reduces HUD's administrative workload and costs.

In 1982, the Department sold 27,092 single family and multifamily units. Your budget assumes the sale of 48,775 units in 1983 and an additional 35,854 units in 1984.

Question: How many have you acutally sold in FY 1983?

Answer: For FY 1983 through March 31, 1983, Department records indicate sales of 12,113 single family units and 13,719 multifamily units for a total of 25,832 units.

Question: Do you now want to revise your FY 1983 or FY 1984 estimates?

Answer: Not at the present time. At present, the FY 1983 sales estimates appear to be attainable and we are not proposing any changes to the estimates. The FY 1984 sales estimate will be reexamined during the development of the FY 1985 Budget. During that process, 1984 sales will be assessed in terms of actual 1983 accomplishments as well as the inventory of properties which will remain potentially eligible for sale during FY 1984.

PENSION FUNDS AND HOUSING INVESTMENTS

Question: Pension funds are viewed by many experts and law makers as an attractive, yet largely untapped, source of capital for real estate financing. Holdings in pension funds total over $700 billion and grow about 10% annually. About $500 billion represents private pension contributions, with the remainder in public pension plans. Housing investment (mortgages and related securities) by fund managers represents only 2-3% of their portfolio, with public funds investing somewhat more. What impact, if any, would increased housing investments by pension funds have on interest rates?

Answer: Union and public pension funds already have substantial housing investments. However, if corporate pension funds increased their housing investment, then several billion dollars could be added to the mortgage market each year. (For example, 8 percent of their annual increase in assets could produce over $7 billion in new mortgage money.) Realistically, however, increased housing investment by pension funds probably would have only a marginal impact on mortgage interest rates. This is because of the tremendous size of the mortgage market, with gross mortgage acquisitions in 1982 amounting to $268 billion. Moreover, mortgage-related securities provide an alternative long-term fixed income investment, similar to other corporate securities. As such, the yields on mortgage-related securities could not be insulated, since these yields move in tandem with other similar investments.

It should be recognized, however, that there are important distinctions between types of mortgage securities and their investment characteristics, which might affect the yields. For example, a mortgage-backed bond represents a liability of the issuer and is generally overcollateralized by a pool of mortgages, i.e., the dollar amount of mortgages collateralizing the bond is typically 125 to 175 percent of the bond amounts. Bonds are issued generally by thrift institutions, e.g., Federal Home Loan Bank Board, FNMA. This bond, is identical to corporate and government bonds in its semi-annual payment of interest only and full principal payment at maturity.

The traditional mortgage-backed, pass-through security is an investment which represents an undivided interest in a pool of mortgages. These securities may be guaranteed by Federal, Federally-sponsored or private insurers. Payments of principal and interest from the pooled mortgages are passed through to the security holders. Since holders of the underlying mortgages remit their payments usually at the beginning of the month, there is a delay in payment to investors resulting in a slight yield reduction. However, the reduction in yield is more than offset by a cash flow which is monthly instead of semi-annually as in the case of bonds.

A third type of instrument, a cash flow bond, is a hybrid of the mortgage-backed bond and pass-through security. The cash flow bond is a debt obligation of the issuer with a fixed coupon and principal repayment schedule, but is also a fully amortizing instrument with an average life equal to (or less than) that of the mortgage collateral pool securing it. These features allow the issuer to structure the maturities of the bonds to match the maturities of the mortgages in the pool. The cash flow bonds provide a direct relationship between the scheduled payments of principal and interest received on the collateral and total debt service on the bonds.

Question: Are there other sources of capital, such as insurance companies and other favored investments, which might also be encouraged to increase their housing investment?

Answer: Depository institutions such as commercial banks and savings and loan associations, will continue to be important sources of housing finance. However, it should be recognized that deregulatory actions, particularly affecting thrifts, will permit a greater flow of savings funds to non-housing investments. Life insurance companies have not been a significant participant in the residential mortgage market over the past several years. At the end of the fourth quarter of 1982, net acquisitions (originations plus purchases minus sales) of long-term mortgage loans by life insurance companies totaled $3.0 billion or around 6 percent of the market. By far, the bulk of mortgage investments by life insurance companies are for nonresidential properties. Such investments usually involve a "piece of the action" in the form of a percent of profits and/or participation in the gain from the sale of property. These deals provide inflation hedges.

It is doubtful that life insurance companies will play a more important role in housing investment. Recent changes in public tastes away from individual whole life plans toward group term insurance have reduced the large cash values previously generated under the whole life plans. To the extent that life insurance companies can act as managers of pension fund investments via commingled funds, they can be a source of finance for housing.

One source of funds that remains to be tapped is the international credit market. On a recent trip to China, Secretary Pierce made stops in Hawaii and Tokyo to discuss with Japanese officials the possibility of their investing in U.S. mortgages and mortgage-backed securities, at interest rates below the current domestic market. This would increase the pool of funds available to American home buyers, and possibly help reduce mortgage interest rates still further. This investment possibility is still under active consideration, with negotiations continuing while potential roadblocks are being analyzed. This source of funds, however, is of an indeterminate size and the prospects are difficult to measure at this time.

Question: To what extent will making housing investment easier for fund managers result in higher risk portfolios?

Answer: The Department of Labor has made it clear that in administering Employee Retirement Income Security Act provisions pension fund managers should be given the greatest possible flexibility, the highest degree of certainty and the least burden of regulation possible without jeopardizing the integrity of pension funds. These managers must take all prudent steps to ensure safe, low risk investments with maximized returns, since the objective of pension funds is to provide retirement income.

In so far as pension fund managers are responsible for their own portfolios, they are obliged to follow this "prudent man" rule and diversify their investments accordingly. Most pension fund managers do not have the underwriting expertise to make direct mortgage originations. But they can make safe housing investments by purchasing privately or Federally insured mortgages in the secondary market or acquisition of mortgage-backed securities. With respect to the latter, analysis of historical performance found that mortgage securities have outperformed corporate bonds with comparable credit ratings over much of the past ten years and the entire period on a cumulative basis. Mortgage-backed securities are attractive when pension fund managers take into account comparative yields, cash flow, safety and liquidity of these types of investments, as compared to alternative investment opportunities.

DEOBLIGATIONS

Question: How much has been deobligated under Section 8 and Public Housing so far this year?

Answer: A total of $684 million in budget authority has been deobligated under Section 8 and Public Housing through April 30, 1983.

Question: Do you believe that you will actually realize your $4.6 billion deobligation estimate for FY 1983? Have you modified your estimate of deobligations as a result of the recently completed Public Housing pipeline survey?

Answer: The $4.6 billion estimate in the 1984 Budget included $3 billion in deobligations which were to result from the termination of 25,000 units of Public Housing during FY 1983. However, P.L. 97-377 contained several provisions which have limited the amount of recaptures that HUD can now achieve in the current fiscal year.

We have revised downward our estimate of Public Housing terminations in FY 1983 as a result of (1) our field survey on the Public Housing pipeline, (2) the Congressional mandate to assist all potentially feasible projects, and (3) the implementation of new development cost limits for Public Housing projects. Under recently announced policies, Public Housing projects now in the pipeline will be given between 12 to 21 months to start construction or be subject to termination. This date can be extended by agreement of HUD and the Public Housing agency under certain circumstances. While the policy of allowing this much time will mean a reduction in potential deobligations in 1983, it will assure that all viable projects are given time to start.

Because of the Congressional actions and our decision to give potentially feasible projects sufficient time to make needed cost savings and reach construction start, we now estimate that recaptures for Public Housing will be approximately $1 billion--and total recaptures for both Public Housing and Section 8 in FY 1983 will be in the range of $2.5-3.0 billion.

Question: If deobligations do not materialize as you plan in 1983 and 1984, have you considered seeking supplemental authority to carry out the program approved by Congress?

Answer: HUD has already increased the request for FY 1984 to reflect the decision by Congress not to approve our proposed $3.1 billion deferral. We do not anticipate any further increases in our request for either year regardless of the level of actual deobligations.

Question: Will enactment of the so called "Jobs Bill" impact on your ability to deobligate funds under Section 236 and Rent Supplement?

Answer: The Administration requested--and Congress provided--sufficient Section 8 authority to fund the conversion of approximately 60,000 units presently being assisted under Rent Supplement or RAP. The "Jobs Bill" will have no impact on the effort to convert these units in 1983. However, as a result of the denial of the Department's proposal to defer $3.1 billion of budget authority from 1983 into 1984 in support of the conversion of 64,101 Rent Supplement and Section 236 units to Section 8 assistance, the Department has had to amend its 1984 request. The 1984 Budget request has been increased by about $101 million of contract authority and $3,081 million of budget authority (budget amendment in House Document 98-50) in order that the Department can continue its plan to convert the Section 236 and Rent Supplement units in 1984.

Question: Your FY 1984 budget projects deobligations of $4.346 billion for 1984. In their markup last week, the House only assumed $1.9 billion. As you know, because of their lower estimate the House had to provide an additional $2.4 billion in new budget authority to fund their program mix--so the deobligation estimate is pretty important. How do you explain this large discrepancy -- do you agree with the House estimate?

Answer: HUD's estimate of 1984 deobligations included $1.6 billion in recaptures which would result from the conversion of units from the current Section 8 existing housing program to the proposed Housing Payment Certificate program. The Administration still strongly supports the enactment of this new program and the conversion of current subsidy contracts to the Housing Payment Certificate program once it is enacted. However, if enactment of this legislation is delayed or does not occur, these conversions would not be possible, and the projected recapture would not result.

The 1984 estimates also assumed Public Housing deobligations of $1.4 billion. The Department still believes this level of deobligations is possible.

The remaining $1.3 billion in projected deobligations in the 1984 Budget estimates was to be the result of terminations in the Section 8 New, Substantial Rehabilitation and Moderate Rehabilitation programs and for Section 8 Opt-Outs. The Department has revised its estimate of New and Substantial Rehabilitation deobligations from 8,000 units to 6,000 units. Consequently, the amount of deobligations has been revised from $1.3 billion to $1.1 billion.

Thus, even assuming that no conversions to the Housing Payment Certificate program occur, we would expect total deobligations for all of Section 8 and Public Housing in 1984 in the range of $2.5 billion. In addition, for each 10,000 units of conversions that occur from the Section 8 Existing program to the Housing Payment Certificate program the estimated level of recaptures would increase by $120 million.

Question: In FY 83, we had approximately $1.6 billion in carryover funds from FY 82. Do you expect any carryover from FY 83 that could be applied to the FY 84 program?

Senator Garn—Continued

Answer: While it is impossible to guarantee that every penny of available authority will be committed by the end of FY 1983, we do not expect any significant amount of authority to be carried over into 1984. Most of the authority available for use this year is for categories where demand is very high (e.g., Section 202, Public Housing Modernization, amendment needs) or for other priority uses (e.g., conversion of Rent Supplement or RAP units to Section 8).

QUESTIONS SUBMITTED BY SENATOR HUDDLESTON

COMMUNITY DEVELOPMENT BLOCK GRANTS

Question: How many grant applications were submitted by non-entitlement areas in FY 82? To date in FY 83?

Answer: In the 36 States, plus Puerto Rico, that administered the program in fiscal year 1982, 5,276 applications were received. In the 14 States where HUD administered the program in fiscal year 1982, 1,650 applications were received. To date in fiscal year 1983 no applications have been received.

Question: How many were funded in FY 82?

Answer: Approximately 1,675 grants were made by the States in 1982, and HUD made 523 grants.

Question: How many states currently administer the so-called small cities portion of CDBG?

Answer: For fiscal year 1983, only three States (Hawaii, Kansas and Maryland) at this time have informed HUD they will not assume responsibility for the program.

Question: Are there any noticeable pattern differences between states where there is federal administration and those where there is state administration, i.e., are there larger grants in one situation than the other or more/fewer funded?

Answer: When comparing the results of the States' efforts in fiscal year 1983 with the program as administered by HUD it in fiscal year 1982, several noticeable differences exist. The States are receiving considerably more applications than HUD did and are funding a greater number of cities resulting in a smaller average grant size. The use of the funds have also shifted. Whereas in the HUD-administered program the primary use was for rehabilitation, that is now shifting to public facilities, i.e., water and sewer facilities. State administration has also seen a substantial increase in the amount of funds being used for economic development. Also, a greater percentage of grants under the State program is being made to the smaller communities.

URBAN DEVELOPMENT ACTION GRANTS

Question: What are current unobligated balances in the UDAG program?

Answer: The unobligated balance for the UDAG program, as of April 30, 1983, was $621.4 million.

Question: What are the current unobligated balances for the Small Cities portion?

Answer: The unobligated balance for the Small Cities portion of the UDAG program, as of April 30, 1983, is estimated at $219.2 million.

Question: It has become increasingly clear that small cities cannot effectively utilize UDAG without technical assistance. What is HUD doing to provide such assistance?

Answer: The Department has under contract three national technical assistance "providers" who have at least some part of their work program aimed at assisting small cities to package UDAG proposals as follows:

(1) National Development Council (NDC) administers for the Department the Small Business Economic Revitalization (SBR) program. A significant element under this program is to train local economic development professionals in 20 States to be able to identify and package UDAG projects, especially small city projects.

(2) Halcyon is the UDAG master contractor. The objective of the contract is to use the expertise of a multi-disciplined team to assist distressed cities plan and package fundable UDAG projects and to work with cities who have trouble implementing a project after they receive preliminary approval of a grant. Since many more small cities have a difficult time in all phases of the UDAG program than large cities, a large percentage of Halcyon's time is spent assisting these small cities.

(3) National Association of State Development Agencies (NASDA). The purpose of this contract is to assist five States to improve their ability to help local governments use CDBG and UDAG funds for economic development in ways that complement the use of other State resources and maximize the leverage of private dollars in a project. As part of this effort, NASDA will provide technical assistance to five States using direct transfer of information from one successful program participant to a potential program participant, especially in small cities.

In addition to these three contracts, UDAG has encouraged and participates in State-sponsored conferences to explain and promote the use of the UDAG program. For example, the States of Arkansas, Maryland, Missouri, Kansas, Massachusetts, Ohio, Florida, Idaho, Michigan, Minnesota, Maine, Louisiana, Georgia, New York, Delaware, Pennsylvania, and Oregon have all held such conferences.

Further, there has been a recent campaign whereby all eligible small cities were sent a specially-designed UDAG small cities pamphlet describing the program and identifying an Area Office contact person to answer any questions regarding the program. The follow-up to this effort shows that it was successful getting the word out to small cities on the availability of the UDAG program.

UDAG technical assistance is funded by the Secretary's Discretionary Fund with Community Development Grants funds, not out of UDAG funds. Small Cities may use up to 3 percent of the approved grant amount to defray its actual costs in planning and preparing its application, including the use of consultants.

HOUSING ASSISTANCE COUNCIL

Question: For several years the Housing Assistance Council (HAC) has been funded out of the Policy Development and Research (PD&R) account. What are your plans for HAC in fiscal year 1984?

Answer: The Department's research budget does not include a specific amount for the Housing Assistance Council in 1984. Plans for funding any given group will depend on the level of research funds appropriated by the Congress and the number of Congressionally mandated research requirements to be undertaken with fiscal year 1984 funds.

Question: How much of the FY 83 PD&R budget is being used for rural housing activities? How much of the FY 1984 request would be?

Answer: For fiscal year 1983, $1,560,000 is currently estimated to be used for rural housing activities. For fiscal year 1984, $125,000 is currently estimated to be used for rural housing based on projects already planned for implementation. However, the 1984 estimate may increase as additional rural housing research activities are proposed for implementation.

Question: Outside of the PD&R account, what is HUD doing in the rural areas in FY 1983? What does it plan for FY 1984?

Answer: A major effort by HUD for rural areas in FY 1983 is the Small Cities Communitiy Block Grant program of which most of the $1 billion will be administered by States. Results of the State program in FY 1982 indicate States have funded more small, rural communities than HUD did in the past, so we can anticipate these areas will receive a substantial share of the total funds available in 1983. Also, results show many of the funds are being used for water and sewer facilities, which is a critical need for small, rural places. Additionally, the Department has provided about $5.8 million in technical assistance grants to States which are using about half of these funds to provide direct technical assistance to small communities. Typically these funds are used to assist these communities to apply for grants, help carry out the grant once it has been received, or develop capacity of local governments in specialized areas, such as financial management.

Under the Urban Development Action Grant program 25 percent of the funds must be used for projects in small cities. Of the total 1983 UDAG appropriation of $440 million, $110 million has been set-aside for small cities projects. A significant number of these projects are expected to be approved for projects in rural areas.

We would anticipate a similar use of both the State CDBG and technical assistance funds in FY 1984. For UDAG, 25 percent of the 1984 appropriation will again be used for Small Cities.

HUD has no specific housing programs targeted exclusively to rural areas. However, our mortgage insurance programs can be used in rural areas, as well as in urban areas. HUD also has taken, or is proposing, several actions which are useful in expanding housing opportunities in rural areas.

These include:

-- Expanding rural lending options by allowing lenders to process loans using FNMA and FHLMC appraisal and mortgage forms.

— Allowing a realtor to earn an origination fee for referring a customer to a rural lender.

— Using Local Area Certification, which lowers development costs and increases affordability. By accepting local subdivision standards that are similar to HUD's, needless duplication has been ended.

-- Working with State Housing Finance Agencies to develop bond-financed mortgage programs.

-- Making available alternative mortgage instruments to encourage new sources of non-Federal funding for housing such as Shared Equity Mortgages (SEM) and Growing Equity Mortgages (GEM), which encourage private lenders to originate mortgage loans they may otherwise have been unwilling or unable to make.

— Revised single family Minimum Property Standards (MPS). HUD'S single family MPS, which also apply to FmHA and VA, were recently revised to provide greater freedom for design based on local needs, by removing livability and marketability criteria. HUD now is considering the possibility of allowing the use of model and local codes, thereby eliminating duplicate Federal standards.

-- Direct Endorsement Processing. This program involves direct under-writing of insured single family morteage loans by approved mortgage lenders. The lender underwrites and closes the mortgage loan, and submits the loan to HUD for insurance endorsement, without obtaining a prior HUD commitment. This simplifies and expedites the process by which mortgagees can secure mortgage insurance endorsements from HUD. Direct Endorsement Processing will enable HUD to tailor FHA loan procedures to the normal business practices of rural lenders.

Senator Huddleston—Continued

-- Congregate Housing Services Program. This is a demonstration program authorized by the Housing and Community Development Amendments of 1978 to provide 3- to 5- year contracts to fund services for eligible residents of Public Housing and Section 202 Housing for the Elderly or Handicapped projects. This program is designed to promote and encourage handicapped elderly, non-elderly handicapped, or temporarily disabled individuals to maintain maximum independence within a home environment when such individuals are capable of semi-assisted independent living given appropriate supportive services. Funds appropriated for FY 1983 include $500,000 earmarked for rural demonstration projects.

GNMA MORTGAGE-BACKED SECURITIES (MBS)

Question: In view of the housing recovery and continued high demand for mortgage refinancing, why do you think the MBS commitment ceiling can be reduced from $68.25 billion in FY 83 to $58.65 billion in FY 84?

Answer: While GNMA expects the current upturn in housing to continue through FY 1984, there are significant factors which will support a lower level of commitments in FY 1984 compared to FY 1983. First, we expect that most of the refinancing of high rate loans will have occurred in FY 1983. We estimate that refinancing is a considerable percentage of current activity.

A second factor is related to means we recently implemented in an attempt to provide greater control over the volume of commitments issued each year. Over the past several years, an increasing amount of the commitments issued each year have not been used and have been allowed to expire. In 1976, approximately $2.8 billion of commitments expired. By 1981 expirations had grown to an annual rate of $41 billion. We expect that the revised application fee structure implemented in 1983 will reverse the trend of rising levels of unused commitments.

Third, we expect the unusually large end-of-year takedown of commitments which has occurred over the past couple of years to moderate. We expect that issuers will become more accustomed to the ceiling knowing that it will not inhibit their ability to obtain a sufficient amount of GNMA commitments to support their annual FHA/VA origination volume.

These several factors are incorporated into the formula that GNMA has adopted for establishing its credit ceiling requests. The formula relates GNMA's credit needs to the Budget requests of FHA and VA. The $58.65 billion requested by GNMA for FY 1984 continues to be consistent with the FHA-VA activity levels projected in the FY 1984 Budget.

Question: If commitment application fees charged in the past more than offset the operating expenses of the program, why are you proposing increased fees?

Answer: The application fee was restructured beginning in FY 1983 in order to provide greater control over the utilization of commitment authority.

GNMA developed the new fee structure as an incentive for issuers to conserve their commitment requests.

The revised fee structure involves a fee of $500 for the first $1.5 million, and $200 for each additional $1.0 million increment per commitment request. Under the previous fee structure, which was a fixed $500 regardless of the commitment amount requested, there was little incentive to conserve on the amount of commitments requested.

Question: Won't these fees ultimately result in higher interest rates to FHA and VA borrowers?

Answer: The revised application fee adds about $3.00 to the cost of originating a $65,000 mortgage loan. This is not likely to have any impact on borrowing costs. Moreover, given the competitive nature of the mortgage lending industry, the cost may not be passed through to home buyers. Again, we believe this to be a less costly alternative for controlling the uneconomic practice of encumbering credit resources, which may not be used, then the imposition of administrative type regulatory controls.

In any event, the fee increase that was implemented has been in place for over 7 months with no major objections raised by program participants.

ENTITLEMENT STATUS UNDER THE COMMUNITY DEVELOPMENT BLOCK GRANT (CDBG) PROGRAM

Question: Please provide a list of the cities and urban counties which stand to lose entitlement status under CDBG. When did HUD determine each no longer qualified, what was the reason for disqualification, what is the current population of each, how much did each receive in FY 83?

Answer: The following is a list of cities and urban counties which, based on current information, may lose entitlement status under CDBG in fiscal year 1984.

City/Urban County	Date HUD Made Preliminary Determination[1]	Reason for Disqualification	Current Population (1980 Census)	FY 1983 CDBG Allocation ($000)
Manchester, CT	Jan. 1983	These places fail the population test used for qualification, and previous legislative amendment which grandfathers them expires in FY 1984.	49,761	$449
Berwyn, IL	Jan. 1983		46,849	1,453
Covington, KY	Jan. 1983		49,574	1,967
Arlington, MA	Jan. 1983		48,219	1,048
Lincoln Park, MI	Jan. 1983		45,105	856
Bloomfield, NJ	Jan. 1983		47,792	1,188
Parsippany-Troy Hills, NJ	Jan. 1983		49,868	330
White Plains, NY[2]	Jan. 1983		46,999	1,100
Midwest City, OK	Jan. 1983		49,559	563
Chester, PA[3]	Jan. 1983		45,794	2,122
Rapid City, SD	Jan. 1983		46,492	629
Anoka County, MN	Jan. 1983	↓	195,998	1,912
Cape Coral, FL	Jan. 1983	Losing designation as central city of Metropolitan Statistical Area (MSA) and current population below 50,000.	32,103	241
Cocoa, FL	Jan. 1983		16,096	288
West Lafayette, IN	Mar. 1983		21,247	300
Muskegon Heights, MI	Jan. 1983		14,611	609
Norton Shores, MI	Jan. 1983		22,025	215
Portage, MI	Jan. 1983		38,157	296
Moss Point, MS	Mar. 1983		18,998	383
Marshall, TX	Jan. 1983		24,921	475
Orange, TX	Jan. 1983		23,628	468
Pharr, TX	Mar. 1983		21,381	749
San Benito, TX	Jan. 1983	↓	17,988	545

[1] Final determination, based on current statutory provisions, cannot be made until end of June 1983 in order to consider final adjusted 1980 census data and final determinations on central cities from Office of Management and Budget.

[2] When final announcements are made by OMB in June 1983, White Plains, New York, is expected to be named a central city, thereby retaining entitlement status.

[3] Chester, Pennsylvania, will be included with Delaware County as part of the urban county since Chester signed a multi-year cooperation agreement with Delaware County.

Question: How many of the above have been "grandfathered"? For what years has each been "grandfathered"?

Answer: The first 12 listed above have been grandfathered. Eleven cities and one urban county were grandfathered in fiscal year 1983. The following list provides the years each was grandfathered.

City/Urban County	Fiscal Years Grandfathered
Manchester, CT	1982, 1983
Berwyn, IL	1978 through 1983
Covington, KY	1978 through 1983
Arlington, MA	1978 through 1983
Lincoln Park, MI	1978 through 1983
Bloomfield, NJ	1981 through 1983
Parsippany-Troy Hills, NJ	1979, 1980, 1982, 1983
White Plains, NY	1978 through 1983
Midwest City, OK	1982, 1983
Chester, PA	1978 through 1983
Rapid City, SD	1983
Anoka County, MN	1982, 1983

Question: Do you expect other cities to be disqualified? When? Please provide the same information for each of these areas as provided for the areas listed in No. 1 above.

Answer: Yes. In addition to the cities identified as losing qualification listed in response to the first question on entitlement status, there may be as many as 16 more cities which will be disqualified because of loss of central city designation. Information about this final group of cities will not be available until the cities are formally announced by OMB in June 1983. Furthermore, the qualification of new central cities within urban counties may cause the qualifying population of those urban counties to fall below 200,000, thereby disqualifying the urban counties when their multiyear agreements expire in fiscal year 1985. While no urban counties would be disqualified on this basis with central cities which have been named to date, there may be some urban counties disqualified in fiscal year 1985 based on naming of the final group of central cities in June.

Question: How many new cities and urban counties do you expect to qualify in FY 84? Please list, give the population of each, the reason for qualifying and the amount you expect each to receive under the FY 84 request.

Answer: We expect approximately 60 new entitlement cities and possibly some new urban counties in fiscal year 1984. The final information on central cities will be released by OMB in June. The HUD urban county qualification process extends into the fall. New urban counties will not be identified until then. So far, based on information contained in the first and second OMB announcements this year, 29 cities have been identified as gaining entitlement status for fiscal year 1984 because of new central city status. HUD has not currently identified two new central cities which would gain entitlement status in fiscal year 1984 except for having signed multi-year cooperation agreements with their urban counties. These places will not be eligible for entitlement status until fiscal 1985 when the multi-year agreements expire.

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The following is a list of cities which, based on current information, are expected to gain entitlement status under CDBG in fiscal year 1984.

City	Reason for HUD Preliminary Determination that City may Qualify for FY 1984	Current Population (1980 Census)	Hypothetical FY 1983 CDBG ($000)
Fort Pierce, FL	Gaining designation as central city of MSA effective June 30, 1983.	33,802	$840
Warner Robins, GA		39,893	490
Goshen, IN		19,665	250
Mishawaka, IN		40,201	530
Frederick, MD		28,086	370
Northampton, MA		29,286	670
Westfield, MA		36,465	390
Midland, MI		37,269	320
Carlisle, PA		18,314	310
Lebanon, PA		25,711	900
Murfreesboro, TN		32,845	450
Mission, TX		22,653	640
Neenah, WI		22,432	210
Aguadilla, PR		54,606	2,760
Bessemer, AL		31,729	800
Dothan, AL		48,750	750
Jacksonville, AR		27,589	310
West Memphis, AR		28,138	690
Lodi, CA		35,221	380
Turlock, CA		26,287	330
Loveland, CO		30,215	270
Palm Bay, FL		18,560	160
Pekin, IL		33,967	380
New Albany, IN		37,103	760
Houma, LA		32,602	650
Thibodaux, LA		15,810	310
Holland, MI		26,281	400
Shawnee, OK		26,506	520
Oak Ridge, TN		27,662	270

Question: Is there any means by which a disqualified city can regain entitlement status? Is there any appeals process?

Answer: Since the basis upon which cities qualify for entitlement status is strictly factual and is dependent upon designations by OMB and Census Data, any city failing to qualify has no remedy other than to show that either the applicable OMB designation or Census Data are inaccurate.

Question: Do you have any concern about the impact losing entitlement would have on the community development activities in the affected areas?

Answer: The undesirable impact, from HUD's viewpoint, lies in the fact that entitlement cities often plan out their CDBG programs assuming that they will receive new funds each year. They thus often plan projects that are staged to receive funding over two or more years. In such cases, an abrupt loss of entitlement status would mean leaving one or more project(s) in a partially completed condition. While the Department does have some concern about the impact on a city's CDBG program caused by an abrupt loss of entitlement status, most such communities should be able to compete effectively for funds set-aside for nonentitlement areas in their State.

FHA INSURANCE

Question: The fiscal year 1983 ceiling for FHA insurance is $45.9 billion. The fiscal year 1984 request is $39.8 billion. Why do you believe a reduction is feasible in view of the expected housing recovery, the high demand for mortgage refinancing and the proposed authorization of new FHA insurance programs?

Answer: Despite the housing recovery which we are now experiencing, and which we expect will continue throughout FY 1984, the Budget reflects the need for a lower credit ceiling for the FHA programs during next year for several reasons. One principal reason is an expected gradual decline in the demand for refinancing.

When long term interest rates first started declining, the volume of refinancing activity under FHA was running as high as 50 percent of HUD's total insurance business. Currently, refinancing constitutes around 30 percent of this total activity. Given the relative attractiveness of fixed-rate FHA financing at the current interest rates, considerable interest in refinancing can be expected--particularly for mortgages with 15-17 percent interest rates or mortgages which require "balloon" payments. Nevertheless, the demand for this refinancing is expected to diminish as interest rates stabilize.

A second major reason why a lower ceiling will be possible is the introduction of a new processing procedure called Direct Endorsement. Through this procedure, private lenders do all of the initial processing--subject to HUD review--and submit only successful applications which meet our standards for insurance endorsement. Under current processing procedures, HUD counts all applications which receive a conditional commitment against the credit ceiling--even though only a percentage of these applications actually reach the firm commitment or request for endorsement stage. Additionally, even after an initial (conditional) commitment is issued, a home may be sold with conventional or VA financing.

While the practice of including all conditional commitments against the ceiling assures that all applicants wishing to receive FHA insurance may do so if they ultimately request it, such practice is an inefficient use of the credit ceiling since a portion of the ceiling is tied up by commitments that will never go to insurance endorsement.

With regard to the proposed new insurance programs, the Administration intends these initiatives to better serve FHA's traditional market by adapting to changes in the way housing finance is being offered in the marketplace. The new programs are not intended to expand FHA's overall role, and therefore, we do not propose increasing the level of credit activity authorized as a result of our legislative initiatives.

Question: What was the amount of commitments made in FY 1982? To date in FY 1983?

Answer: For FY 1982, a total of $18.6 billion of insurance commitments were issued. Through the end of April 1983 we had commitments of $26.5 billion. The President has recently announced a proposed increase in the FY 1983 credit ceiling for FHA of $5 billion. This would raise the FY 1983 ceiling to $50.9 billion.

Question: For which of the programs do premiums cover the costs, i.e., which of the FHA programs are self-financing?

Answer: A recent HUD study determined that the Mutual Mortgage and Cooperative Management Housing Insurance Funds were self-sufficient in the following sense: For FHA insured mortgages currently in force under these programs, the Department expects future income to exceed future expenses. However, because HUD does not have control over various national and local economic factors, i.e., interest rates, unemployment and housing values, it is difficult to predict the outcome of mortgages which may be insured by FHA in the future. Also, it should be emphasized that the projected positive net balance does not necessarily indicate that the premiums currently charged will be adequate to cover expenses for future insurance written. The other two insurance Funds, the General Insurance Fund and the Special Risk Insurance Fund are not self-sustaining and require appropriations each year to reimburse these Funds for losses sustained from the sale of acquired properties.

PUBLIC HOUSING PIPELINE

Question: How many units are currently in the Public Housing pipeline?

Answer: A field survey completed on February 18, 1983 identified 1,251 projects with 64,547 units that had received a fund reservation but had not yet started construction. In addition, there are approximately 700 projects representing over 32,000 units for which no development budgets have been submitted and which were not included in the survey.

Question: You had projected that 25,000 units would be cancelled in FY 1983, for a recapture of $3 billion. What are your current projections?

Answer: Based on the results of the field survey, the impact of the Further Continuing Appropriation Act, 1983, (P.L. 97-377), the implementation of HUD's regulations controlling development costs, and the recent policies on cancelling projects which do not meet established construction start dates, we now estimate that between 7,000 and 10,000 Public Housing units will be cancelled during FY 1983. This would result in deobligations of between $1 billion and $1.4 billion.

However, the Department also has offered PHAs the option of voluntarily terminating certain Public Housing fund reservations in return for up to 2 units of Section 8 existing housing or one and one-half units of moderate rehabilitation subsidies. Depending on PHA actions, actual deobligations in FY 1983 could be much higher than the current estimates.

Question: Why were your earlier projections so far wrong?

Answer: The principal reason is that our original estimate assumed timely implementation of HUD's published cost control regulations and also assumed that projects which did not meet these limits or which were stalled in the pre-construction pipeline would be cancelled during the current year.

Since our Budget was proposed, enactment of P.L. 97-377 prohibited the implementation of the development cost regulations until the Department provided an analysis of their impact on the pipeline and directed that HUD provide projects in the pipeline an adequate opportunity to reach construction start. The Department has worked with both Committees to provide the requested analysis and has reached an agreed upon timetable for projects to start construction or be terminated. While the immediate impact of these agreements is a probable reduction in deobligations during the current year, the long term results will be what both HUD and Congress intend: projects which can be built in a timely and cost-effective manner will be built, while those which cannot be built in such manner will be cancelled and the budget authority recaptured.

Question: How many existing Section 8 projects will you be able to fund with the recapture amounts (82,000 were projected in the FY 1983 appropriation)?

Answer: The Further Continuing Appropriations Act, 1983 (P.L. 97-377) assumed the use of $4.862 billion (primarily from $4.6 billion of estimated recaptures) for 67,146 existing housing units and 15,000 moderate rehabilitation units under the Section 8 program. Assuming that total recaptures from both Public Housing and Section 8 in 1983 reach approximately $2.3 billion, about 42,200 units could be supported under the two programs using the same proportional relationship between programs as was assumed in P.L. 97-377.

GNMA TANDEM FUNDS

Question: In early April, the $250 million appropriated for the 20 percent Section 8 projects was released. I understand that all but one project participating in the lottery were funded.

Was that one project not funded for lack of funds or for other reasons?

Answer: The one unsuccessful project in the Section 8 Tandem lottery was not funded due to lack of funds. When that project was drawn in the lottery there was not enough money left to fund it. Therefore, that project was skipped and this enabled all of the remaining projects to be funded.

Question: Prior to the lottery, 10 percent of the funds were set aside for mortgage increases.

How is that $25 million actually being used?

Answer: The $25 million reserve has been set aside for future commitment increases. The GNMA Sellers Guide provides that increases will not be permitted until after initial endorsement of the project and will be approved only to the extent that FHA approves mortgage increases prior to final endorsement. As in the past few years, GNMA will not approve commitment increases based on an enlargement of the project or the addition of amenities.

Question: Has it all been spent?

Answer: One commitment increase has been approved to date for $164,000.

Question: What was the cost of running the lottery?

Answer: The cost was as follows:

Peat, Marwick, Mitchell & Co.	$15,620
Price Waterhouse	1,343
Total	$16,963

Question: Why did you need both Peat, Marwick and Price Waterhouse?

Answer: On April 5, 1983, GNMA held a lottery to determine the distribution of $250 million of Section 8 commitments under the Special Assistance Functions Fund.

In order to assure an unbiased method for the allocation of these commitment funds among the eligible applicants, GNMA hired two public accounting firms (Peat, Marwick, Mitchell and Company and Price Waterhouse). Two public accounting firms were required to provide assurance to the Government and to the applicants, that all project applicants were included and that the lottery was fair and unbiased in its selection.

The selection process was as follows:

1. Acting as agent for GNMA, the Federal National Mortgage Association (FNMA), received telephone applications for lottery participation from project mortgagees who already had firm commitments for Federal Housing Administration (FHA) mortgage insurance, and who otherwise met the eligibility requirements.

2. Peat, Marwick, Mitchell and Co., independent certified public accountants, monitored the telephone applications to assure the accuracy of the written records of those calls.

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3. FNMA delivered to GNMA and Peat, Marwick a listing of these applicants on the lottery day, identified only by a code number assigned independently by FNMA.

4. Price, Waterhouse & Co., another independent firm of certified public accountants, was engaged to assign, in random sequence, a number to each of these projects.

5. Peat, Marwick had generated their own random sequence of the same numbers, which was not revealed until Price, Waterhouse had made their assignment of numbers and left the lottery room.

6. As Peat, Marwick announced their sequence of the random numbers, the project with the corresponding number assigned by Price, Waterhouse, was listed for funding, until all funds were exhausted.

7. The list of winning code numbers was checked by Peat, Marwick.

8. The coded list was turned over to FNMA for decoding--matching the project numbers and FHA contract numbers to the winning lottery numbers.

9. The list was rechecked for accuracy in every regard.

10. FNMA returned the list to Peat, Marwick for review and final certification.

11. GNMA received the certified list of selected projects and notified the successful sponsors and mortgagees.

Question: Under the targeted tandem program, projects were to be funded according to firm commitment dates. What projects were funded and what was the commitment amount for each?

Answer:

Successful Applicants - Targeted Tandem (Program 27M)

Project Name	Location	Project Number	Firm Date	Commitment Amount
Twin Oaks Apts	Decatur, IL	07235080	030581	$ 4,504,400
Presidential Towers	Chicago, IL	07132113	052781	158,900,000
River City	Chicago, IL	07132105	111081	47,297,700
Terminals Building	Chicago, IL	07135373	120181	2,608,000
Grelot Road Apts	Mobile, AL	06235370	120981	3,436,100
Avondale Edgewater Apts	Avondale, AZ	12335124	120981	4,970,900
Park Meadows I	Madison, WI	07535298	121181	4,206,700
Park Meadows II	Madison, WI	07535299	121181	3,800,700
Gulfport II Apts	Gulfport, MS	06535356	121581	1,771,300
McDowell Road Apts.	Jackson, MS	06535313	121681	1,478,900
Sub-total				232,974,700
			Reserve	17,025,300
				250,000,000

Question: Please list the targeted tandem projects with firm commitments which have not been funded.

What is the date of firm commitment and the amount involved in each?

Answer: The list below details all unfunded projects for which the mortgagee requested Targeted Tandem funds under Program 27M. It should be noted that GNMA has no means of determining the number of projects with firm commitments whose sponsors might be interested in participating in the Targeted Tandem program but did not call in for Program 27M.

Unfunded - Targeted Tandem (Program 27M)

Project Name	Location	Project Number	Firm Date	Commitment Amount
Crestwood Lake Sec.	Yonkers, NY	01235570PMEC	122981	$8,752,400
Donner Gardens	Queens, NY	01235571PMEC	122381	3,160,100
Anita Terrace	Queens, NY	01235573PMEC	021482	9,007,800
Heritage Acre IX	Bristol, VA	05135348PM	011882	5,099,300
The Chicago Beach	Chicago, IL	07132107PM	011282	1,891,600
Lincoln Place	Chicago, IL	07132121	011282	10,773,100
Courtyard Square Apts	Milwaukee, WI	07532009R1	122981	4,521,900
Northwood Court Apts	Milwaukee, WI	07535308PM	122981	3,875,900
Rivertrace Phase II	Memphis, TN	08135184PM	122981	4,888,300
Walnut Grove Apts	Milan, TN	08635154PM	011282	1,167,900
Blythe Ferry Apts	Cleveland, TN	08735113PM	010782	2,930,600
Country Villa	Chattanooga, TN	08735142PM	011782	3,543,000
Deer Run	Bristol, TN	08735143PM	012282	2,117,600
Windridge Apts	Chattanooga, TN	08735155PM	011582	5,294,000
Cook Street Apts	Riverside, CA	14335056PM	061281	1,658,600
		Total		68,682,100

Question: If a policy of reinstating firm commitments were adopted, how many projects could qualify for tandem money?

Please give the date to which reinstatement could take place and the amount involved in each.

Answer: GNMA has no way of determining how many projects could qualify for Targeted Tandem if expired firm commitments were to be reinstated. We received letters from a few sponsors objecting to the policy against reinstatements but we have no way of knowing whether there are other projects which might otherwise be eligible or of knowing whether the projects with expired firm commitments would actually be feasible if reprocessed.

MINIMUM PROPERTY STANDARDS

In September 1982, HUD regulations making major changes in Minimum Property Standards (MPS) for one and two family dwellings became effective. Basically, these regulations eliminated the so-called livability and marketability criteria from MPS.

Question: What has been HUD's experience with the new regulations?

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Answer: Because of the short period of time that the Minimum Property Standard revisions for one- and two-family dwellings have been in effect, it is not yet possible to provide an assessment of their overall impact.

Question: Have additional properties qualified as a result?

Answer: Single-family application activity during FY 1983 has been substantially higher than the comparable activity during FY 1982. However, this increase is thought to be attributable to the substantial decline in mortgage interest rates and the overall economic recovery. While the revised MPS may have contributed to the increased activity, it is not possible to determine the extent of its impact on increased application activity.

Question: Have HUD's financial interests in the affected properties been protected?

Answer: To date, the Department has no information to indicate that the revised MPS have jeopardized HUD's financial interest. The Department does not believe that the revised MPS will have any adverse effect on HUD's financial interests.

Question: Is HUD contemplating additional changes or perhaps even going to local building codes or something similar?

Answer: We do plan to make additional changes in these standards in order to place greater reliance on local codes. We plan to publish a proposed rule on this matter for public comment in the near future.

PUBLIC HOUSING OPERATING SUBSIDIES

Question: If the Performance Funding System (PFS) were simply extended through FY 84, rather than going to the fair market rents (FMR), how much would be necessary to fully fund PFS?

Answer: Requirements for Operating Subsidies for 1984 under the Performance Funding System (PFS) approach would vary depending upon the rate at which Public Housing units drop out of the inventory and whether certain proposals relating to tenant rent contributions included in the Budget are realized. The table below presents the range of 1984 subsidy requirements under various rates of unit loss and tenant rent burden assumptions:

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	Assuming 5,000 Unit Dropout in FY 1984	Assuming 15,000 Unit Dropout in FY 1984
	(Dollars in Millions)	
Estimated PFS requirements based on 1984 budget utility assumptions	$1,409.7	$1,393.9
Elimination of savings accruing as a result of counting Food Stamps as income	+126.0	+126.0
10 percent cap on tenant rent increase instead of the 20 percent proposed in 1984 Budget	+8.0	+8.0
Savings accruing from 13 percent oil price decrease in 1983	-32.5	-32.2
Adjusted PFS 1984 Requirement	1,511.2	1,495.7

The first option assumes a 5,000 unit dropout from the existing inventory in FY 1984 and the second option assumes a 15,000 unit dropout in FY 1984. The number of units that will drop out will depend on such factors as how the $2.5 billion of new Modernization Budget Authority in FY 1983 is utilized and any revision of the policy on the payment of operating subsidies for vacant units. Final decisions on these factors will influence the number that will dropout in FY 1983 and FY 1984.

The possible savings from decreases in heating oil prices noted above are based on information from the Congressional Budget Office (CBO). CBO analysts report that wholesale heating oil prices had dropped from an average of $.92 a gallon in 1982 to $.85 a gallon in January 1983, a 7.6 percent decrease. While they have not made projections based on the recent price drop, they do predict that 1983 prices could possibly be as low as $.80 a gallon, a 13 percent decrease. CBO also projects that oil prices will be flat in 1984 and 1985. The levels of possible savings are based on these assumptions. The table above assumes a 13 percent decline in prices in 1983. If oil prices decline by only 7.6 percent over amounts heretofore assumed, the savings would range between $22.6 million and $22.8 million.

Question: Please explain exactly how the FMR would be determined.

Answer: Under the Department's proposals, FMRs would be set at the 40th percentile of rents for all units that pass the Section 8 Housing Quality Standards except new (those completed within the prior two years) and subsidized units. These FMRs would be the same for all housing programs--e.g., for the Section 8 Existing program, or the Housing Payment Certificate ("vouchers") program--as well as Public Housing. The FMRs would be contained both in regulations and in legislation, in order to ensure the stability of the system. The annual determination of FMRs would be based on local rent levels for standard quality units identified from the American (formerly Annual) Housing Survey, conducted by the Census Bureau, and the

Consumer Price Index. These FMRs are to be published for comment each year, and adjusted when PHAs can show through local rent survey data that the proposed FMRs do not accurately reflect local rent levels.

The annual adjustment to the FMR subsidy will be equal to the increase in the FMR. For instance, if the FMR for a two-bedroom unit changed from $350 in 1984 to $370 in 1985, the base for calculating the PHA subsidy for that size unit would also increase by $20. The actual amount of the subsidy also would depend on the amount of tenant-paid rents.

Question: Why did you select the 40 percentile? Aren't many buildings in this group undermaintained?

Answer: The 40th percentile was selected as the FMR rent standard for Public Housing to assure the same level of funding as would be available for subsidizing households under the Housing Payment Certificates Program. This FMR was determined after a careful analysis of the type of housing that is available at this rent level in different housing markets. Forty percent of all the owners of standard quality housing in each area receive lower rents. The FMR will not be subject to arbitrary changes, since it must be set at a level that enables the Section 8 Existing or Housing Payment Certificates Program to operate successfully.

Substandard housing is eliminated from consideration in setting the FMR standard. Thus, the standard would be set at the 40th percentile of all standard, well-maintained units. In fact, some buildings at the very lowest end of the rent range (e.g., the 10th percentile) may eventually become substandard due to lack of good maintenance. At the 40th percentile, however, rental income is high enough to ensure strong incentives for continued good maintenance in the private market.

Question: How will public housing rents calculate into the FMR formula?

Answer: Public housing rents will be used to calculate subsidy levels just as is now done in the Section 8 Existing program. That is, tenant rent charges are deducted from the actual unit rent level to arrive at the subsidy amount.

The basic FMR subsidy calculation is as follows:

Fair Market Rent (at 40th percentile)

minus tenant rents and
minus debt service (less of actual debt service payment or 20 percent of the FMR)
equals Federal subsidy payment.

Where tenants pay their own utilities, the amount of tenant-paid utilities also is subtracted. A hypothetical example of the manner in which the per-unit subsidy would be developed under the proposed market-based system and the role played by tenant rent and utility payments in the subsidy computation is presented in the following table:

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	PHA Pays Utilities	Tenant Pays Utilities
Local Fair Market Rent	$300	$300
Less: Tenant Rent	-100	-70
Less: Tenant Paid Utilities ..	-0	-30
Less: Debt Service	-60	-60
Equals: HUD Subsidy	$140	$140

Question: Isn't the population served by assisted housing a more expensive population to serve than the population served by private housing?

Answer: High-rise public housing projects occupied by families have been found to cost more to operate than the private market housing that would be used to house the same families in the Section 8 program. In particular, it appears that buildings with elevators are expensive to operate if there are large numbers of children present. It is not feasible to alter the use of such public housing projects on a large scale, and HUD is accordingly proposing a higher FMR to apply to this one special case.

It is not apparent, however, that the very fact that tenants are low-income means that there are extra expenses involved in providing them with housing. The Section 8 Existing program serves a larger percentage of very low-income families, including single-parent families, than does public housing. The Section 8 Existing program, therefore, provides a fair basis for evaluating the cost of serving very low-income families.

The concentration of low-income families in public housing projects may make the projects suitable locations for social services but such services generally cannot be paid for with limited housing subsidy funds. Also, security is often cited as a special public housing expense, but in fact is a small fraction of most PHA operating budgets. If projects are located in neighborhoods that require intensive police protection, this should be provided by the local jurisdiction and not paid for by Federal public housing subsidies.

SECTION 202

Question: What is the interest rate on Section 202 loans for fiscal 1983?

Answer: The interest rate that the sponsors pay the Department on Section 202 loans originated in FY 1983 is 9.25 percent.

Question: How does this compare with the average Treasury borrowing cost -- did you have to seek clearance for a lower rate?

Answer: The interest rate that the Department is paying Treasury for funds borrowed in FY 1983 is 11.41 percent. The Department was directed by the FY 1983 Continuing Resolution to limit the interest rate to 9.25 percent.

Question: What interest rate do you anticipate for fiscal 1984?

Answer: The Section 202 program interest rate is based on the average interest rate on all interest bearing obligations to the U.S. then forming a part of the public debt computed at the end of the fiscal year. While it is highly speculative to give an anticipated rate for FY 1984, the Treasury end-of-year computation could fall within a range of 9-10 percent. To determine the Section 202 rate in accordance with Section 885.410(g)(1), one would have to add one-fourth of one percent (1/4) per annum to the base Treasury rate. HUD receives the rate determined in accordance with the above by October 15 of each year.

Question: What rate is generally required in order for most projects to be viable?

Answer: It is generally held that most Section 202 projects can be financially viable when the interest rate paid by the sponsor does not exceed 10-10 1/2 percent. However, it should be noted that in addition to interest rates, other factors (i.e. Fair Market Rents) must also be considered in determining the feasibility of a project.

Question: For a large part of fiscal 1983, there have been no Section 8 funds for use in conjunction with Section 202 loan funds. How much of the FY 1983 loan funds were committed during this period?

Answer: The Department operated from October 1, 1982 to December 31, 1982 without Section 8 authority for use in connection with the Section 202 loan program. The Further Continuing Resolution Act of 1983, signed by the President on December 21, 1983, provided $91,700,000 in Section 8 contract authority for use with Section 202. During this interim period, and in order to avoid delay with Section 202 projects that were in a position to proceed with loan closing and the start of construction, the Department granted special authorization to issue firm commitments and conduct loan closings even though there was insufficient Section 8 contract authority to cover the entire Section 8 needs reflected in processing.

Approximately $500,000 to $700,000 in Section 8 contract authority was authorized during this interim period. With the Section 8 authority provided in the Further Continuing Resolution Act, most of this authority has been assigned to the specific projects.

Question: What impact did the lack of Section 8 funds have on the program?

Answer: With regard to projects in the pipeline, the lack of Section 8 had a very minimal impact in view of the special authorization mentioned above.

With regard to the invitation for new FY 1983 applications, the impact was a minor delay of one month, since we could not finalize our funding plan until the Further Continuing Resolution was enacted.

Question: In October 1982, HUD proposed new regulations designed to restrain housing costs under the Section 202 program. What is the status of those regulations?

Answer: After a public comment period, the Regulatory amendments were published in the Federal Register on March 18, 1982 with an effective date of May 2, 1983. The provisions of the cost savings procedures will apply to all Section 202 projects funded in FY 1983 and subsequent years.

QUESTIONS SUBMITTED BY SENATOR D'AMATO

EXTENDED FAF PROGRAM

Question: As you know Mr. Secretary, with the support of Chairman Garn and Hatfield, I was able to successfully attach an amendment to last years Continuing Resolution which extended the Financing Adjustment Factor (FAF) deadline from October 1, 1982 to January 1, 1983 and allowed approximately 30,000 previously allocated Section 8 pipeline units to go to construction. Can you update the committee on the results of HUD's implementation of the extended FAF program in New York and other affected areas of the country?

Answer: The following table indicates the number of units assisted:

	FY 1982		FY 1983 October 1 through January 1		FY 1983 October 1 through March 31	
	National	New York	National	New York	National	New York
			(Dollars in Millions)			
Units......	74,840	3,680	4,192	320	7,173	320
Contract Authority.	$103.0	$4.7	$6.9	$0.2	$10.8	$0.2
Budget Authority.	2,398.7	100.3	199.3	4.3	321.1	4.3

HOUSING PAYMENT CERTFICATE PROGRAM

Question: It seems obvious to me that the new "Voucher" or "Housing Payment Certificate" program has underlying it a basic assumption, which you mention in your testimony, that decent rental housing is available out there somewhere. As you know, Mr. Secretary, New York City currently suffers under a 2% vacancy rate. To what extent do you believe that a low income apartment seeker, probably with a large family to house with him/her will have any bargaining power whatsoever in searching for affordable housing in a city like New York?

Answer: The Housing Assistance Supply Experiment showed that a "voucher" or "housing payment certificate" approach works in tight markets (those with low vacancy rates), about as well as it does in other types of markets. Although New York City does have unusually difficult market conditions, due in part to rent control, experience under the Section 8 Existing Housing program shows that the certificate approach can work in New York. The fact that over 40,000 renters are receiving assistance under the Existing Housing Program in New York City attests to this.

Second, most of the participants in the Existing Housing Program are not large families. Nationally, only about 10 percent of all participants fall in this category. For those large families that do participate, we are considering options that would boost the likelihood of their success in utilizing their certificate, including the option of allowing for a higher payment standard for such families.

Question: Faced with these harsh realities, is not the "shoppers' incentive" concept really an illusion?

Answer: The "shoppers' incentive" concept will work where the rents charged in the private market offer a range of choices (i.e., do not all fall within a few dollars of the payment standard) and where participants successfully negotiate for rents below the payment standard, when appropriate, given local market conditions. To some extent, the willingness and ability of the participant to shop wisely will determine the workability of the shoppers' incentive. It also should be noted that the savings associated with renting a unit below the payment standard apply for participants who rent in-place as well as for those who move to another unit.

SUBCOMMITTEE RECESS

The subcommittee will stand in recess until Monday, May 23, 1983, at 10 a.m., when we will receive testimony from public witnesses concerning various agency budgets that fall under the jurisdiction of the subcommittee.

The subcommittee is recessed.

[Whereupon, at 11:33 a.m. Thursday, May 12, the subcommittee was recessed to reconvene at 10 a.m. Monday, May 23.]

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